Reviewing Wetland Banking and Replacement Projects/Plans

BWSR Staff

2011 BWSR Academy

Goal for All Wetland Banking / Replacement Projects

"Self-Sustaining Projects that meet defined goals"

How Do (Should) We Accomplish This?

LGU

BWSR

TEP

Corps

Through the Site/Application Review and Approval Process

Session Outline

- Goals of The Review Process
- Where / When Things go Wrong
- The Review Process
- General Review Components
- Key Restoration Strategies
- Roles and Responsibilities
- WCA Rule and Program Guidance
- Making Difficult Decisions

Session Outline

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Goals of the Review Process

- Promote/encourage the restoration of high quality sites that are sustainable

Goals of the Review Process

- Provide comprehensive, valued comments, findings, and decisions
- Be consistent with WCA rule and program guidance

Goals of the Review Process

- Reduce an applicant's risk and/or investment

Goals of the Review Process

- Not allow poor sites to be used or bad construction strategies to be implemented

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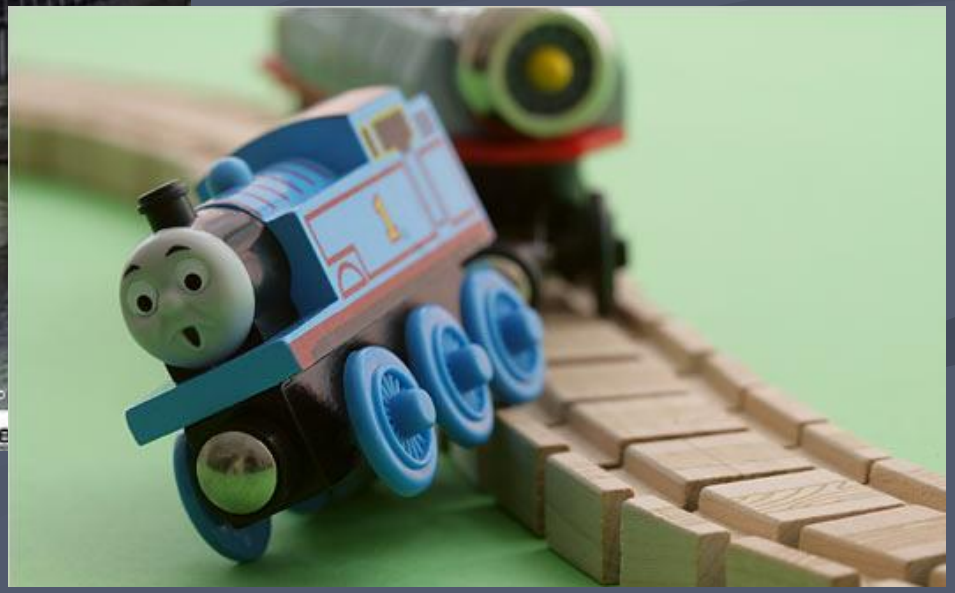
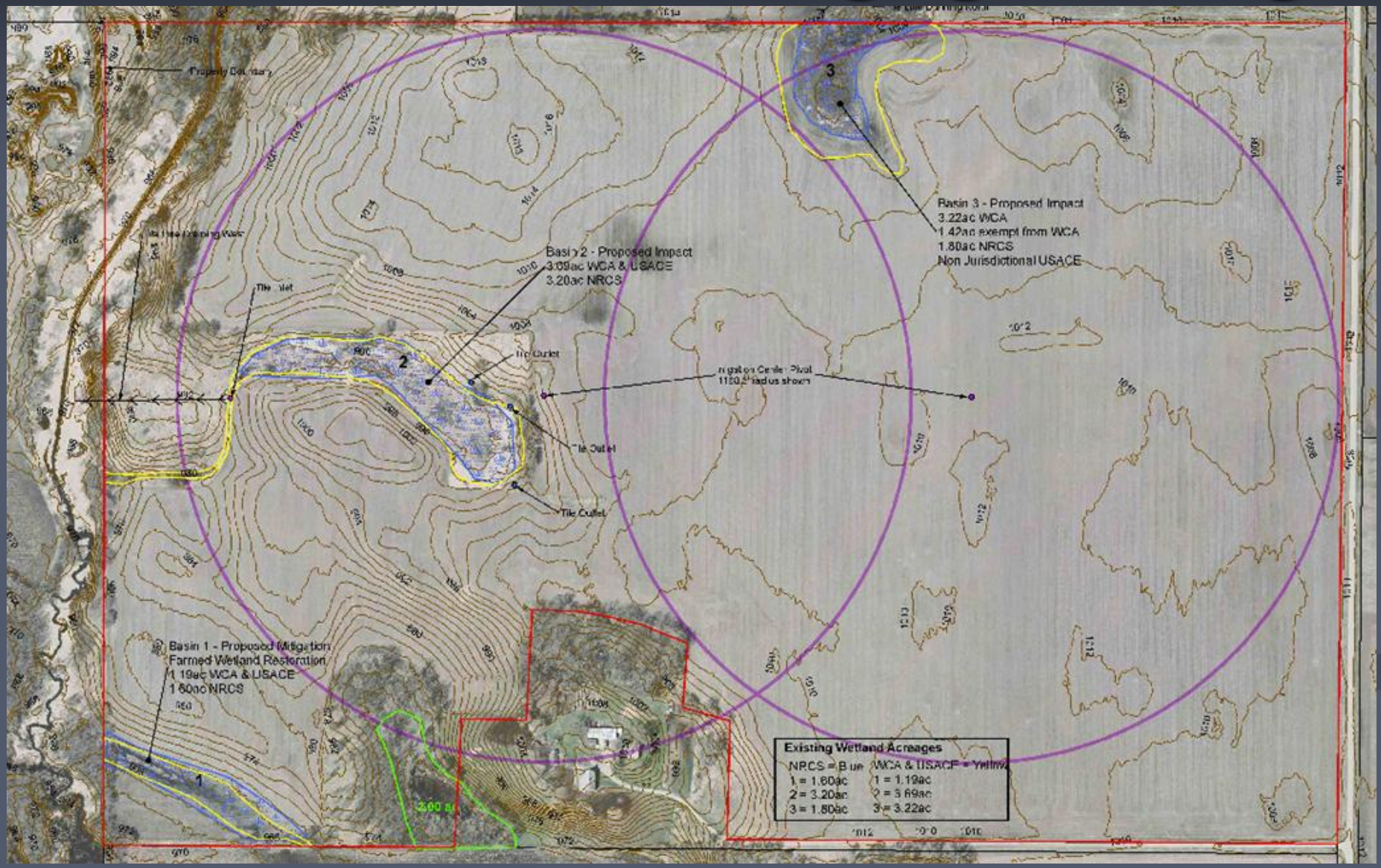
Where / When Things go Wrong



Where / When Things go Wrong



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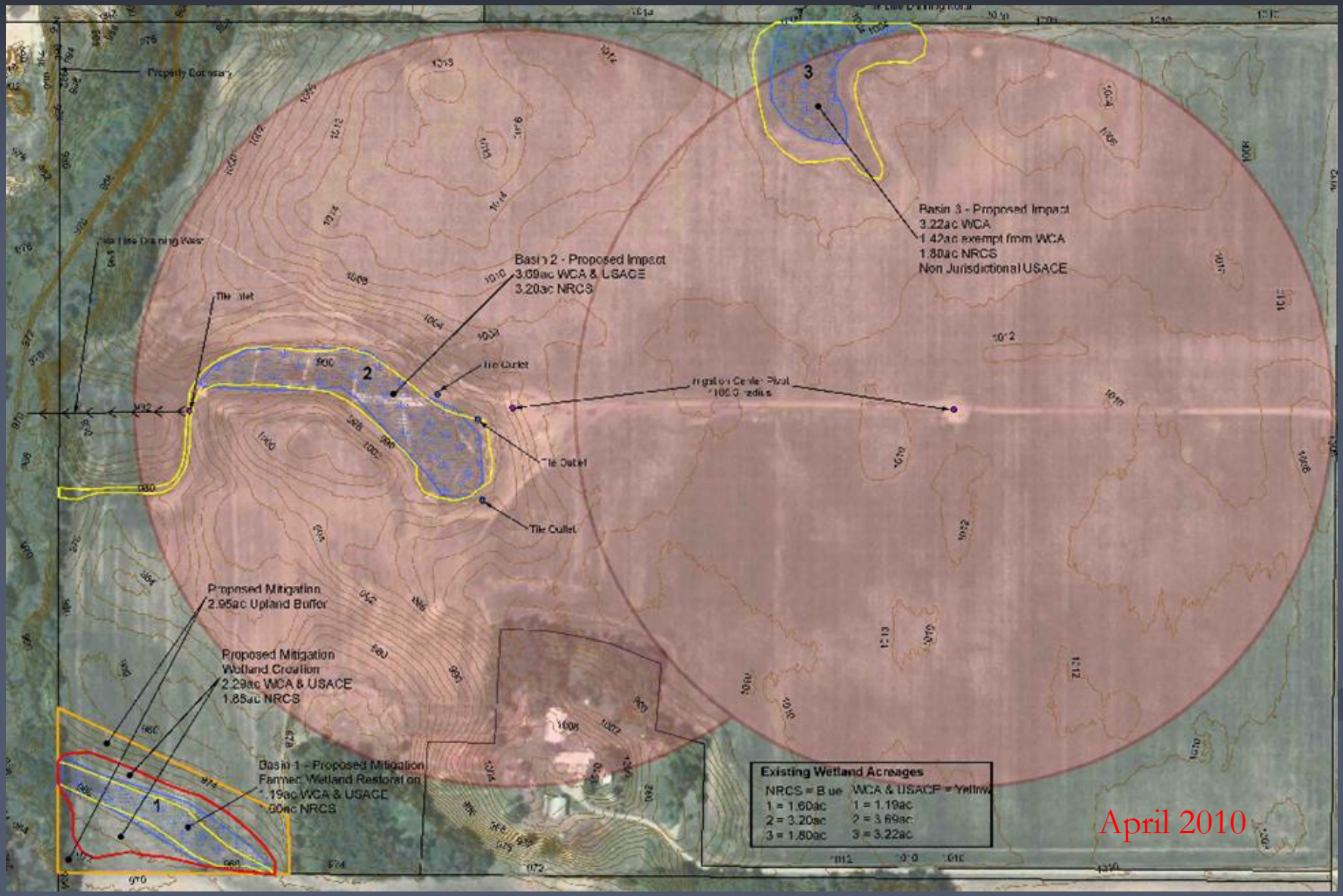

Multiple Agency Jurisdiction

Table 3. WCA Wetland Impact Summary

Wetland Basin	Delineated Area (Acres)	Impact	Replacement Ratio	Replacement Credit Needed (Acres)
2	3.69	Drain & Fill Wetland	1:1	3.69
3*	1.80	Drain & Fill Wetland	1:1	1.80
4**	1.02	Remove Vegetation	1:1	1.02
Mitigation Basin	0.48	Construct Dike	1:1	0.48
Total	6.99			**6.99**

Table 5. NRCS Wetland Impact Summary

Wetland Basin	Delineated Area (Acres)	Impact	Replacement Ratio	Replacement Credit Needed (Acres)
2	3.20	Drain & Fill Wetland	1:1	3.20
3	1.80	Drain & Fill Wetland	1:1	1.80
4*	1.02	Remove Vegetation	1:1	1.02
Mitigation Basin	0.48	Construct Dike	1:1	0.48
Total	6.50			**6.50**

* 1.02 acres of impact to the 2.60 acre wetland on the applicant's property.

Table 7. USACE Wetland Impact Summary

Wetland Basin	Delineated Area (Acres)	Impact	Replacement Ratio	Replacement Credit Needed (Acres)
2	3.69	Drain & Fill Wetland	2:1	7.38
4*	1.02	Remove Vegetation	2:1	2.04
Mitigation Basin	0.48	Construct Dike	2:1	0.96
Total	5.19			**10.38**

* 1.02 acres of impact to the 2.60 acre wetland on the applicant's property.

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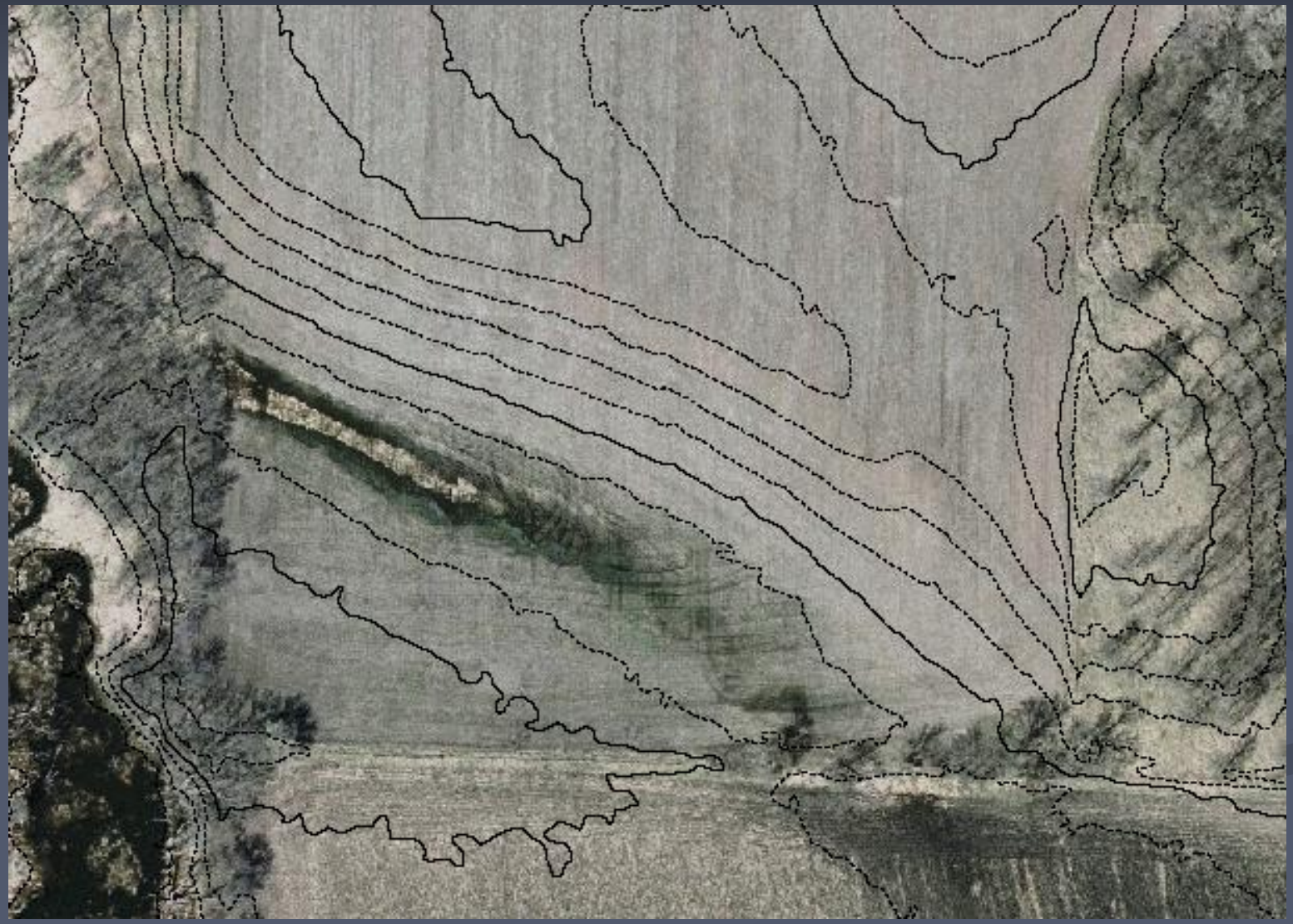
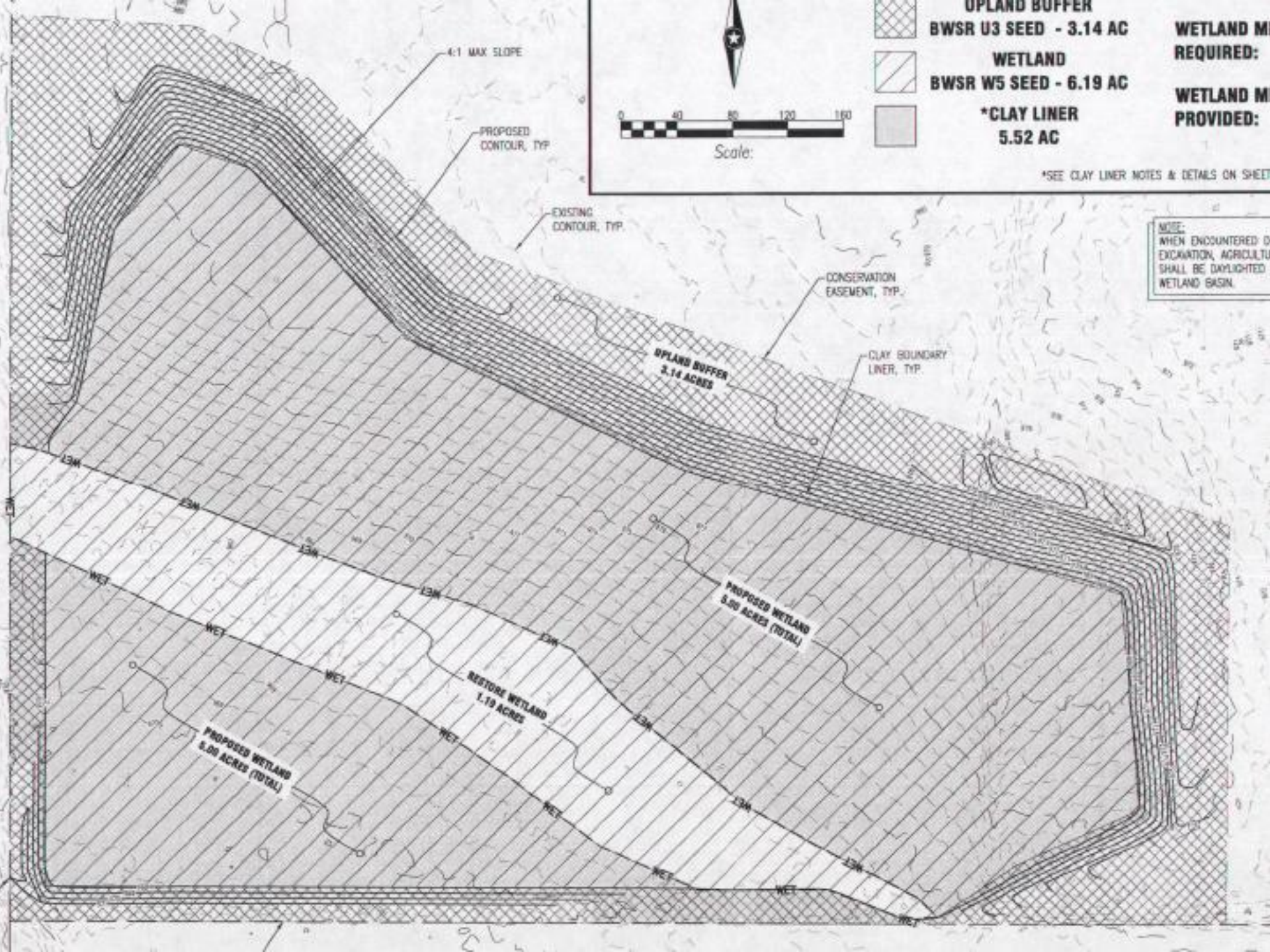
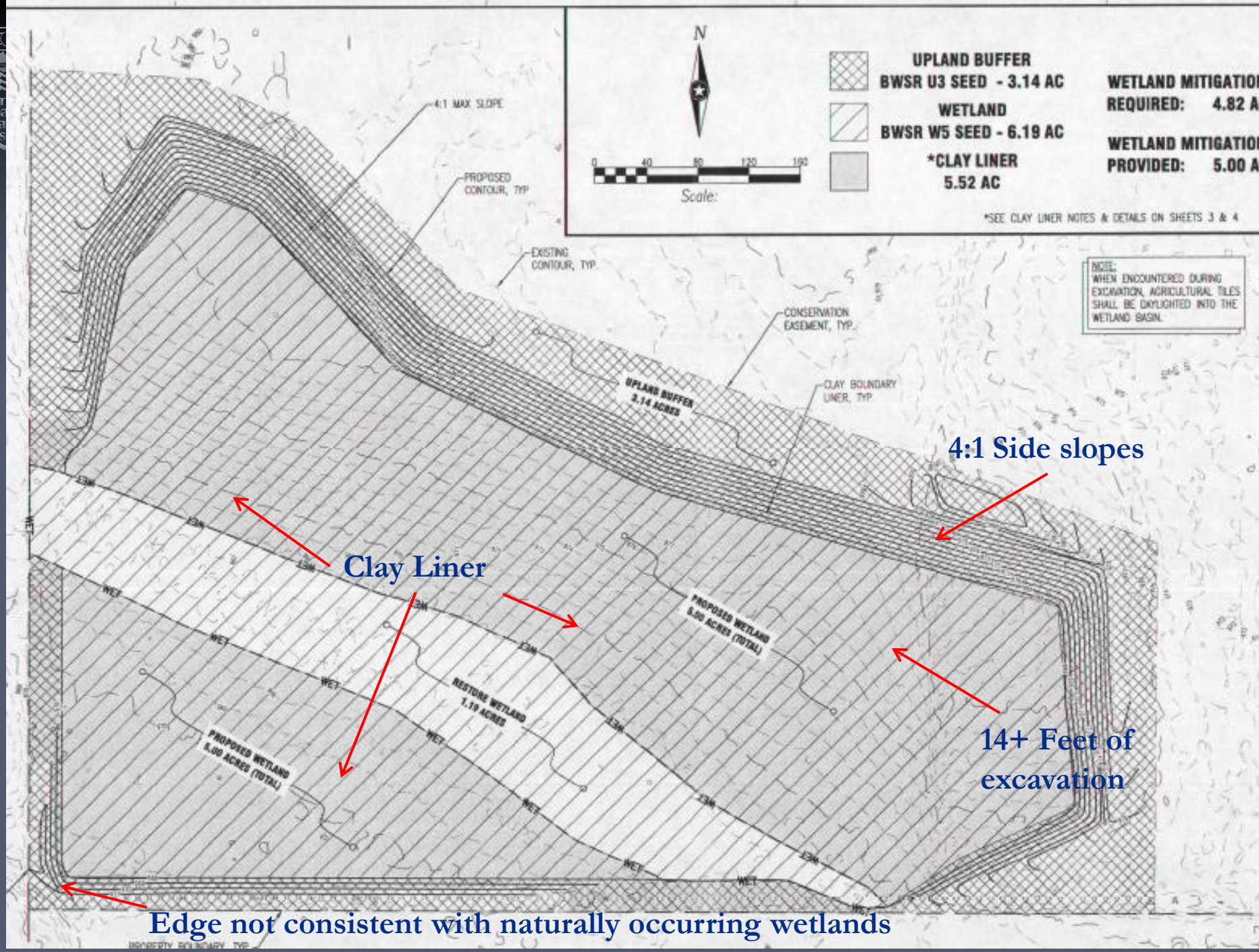
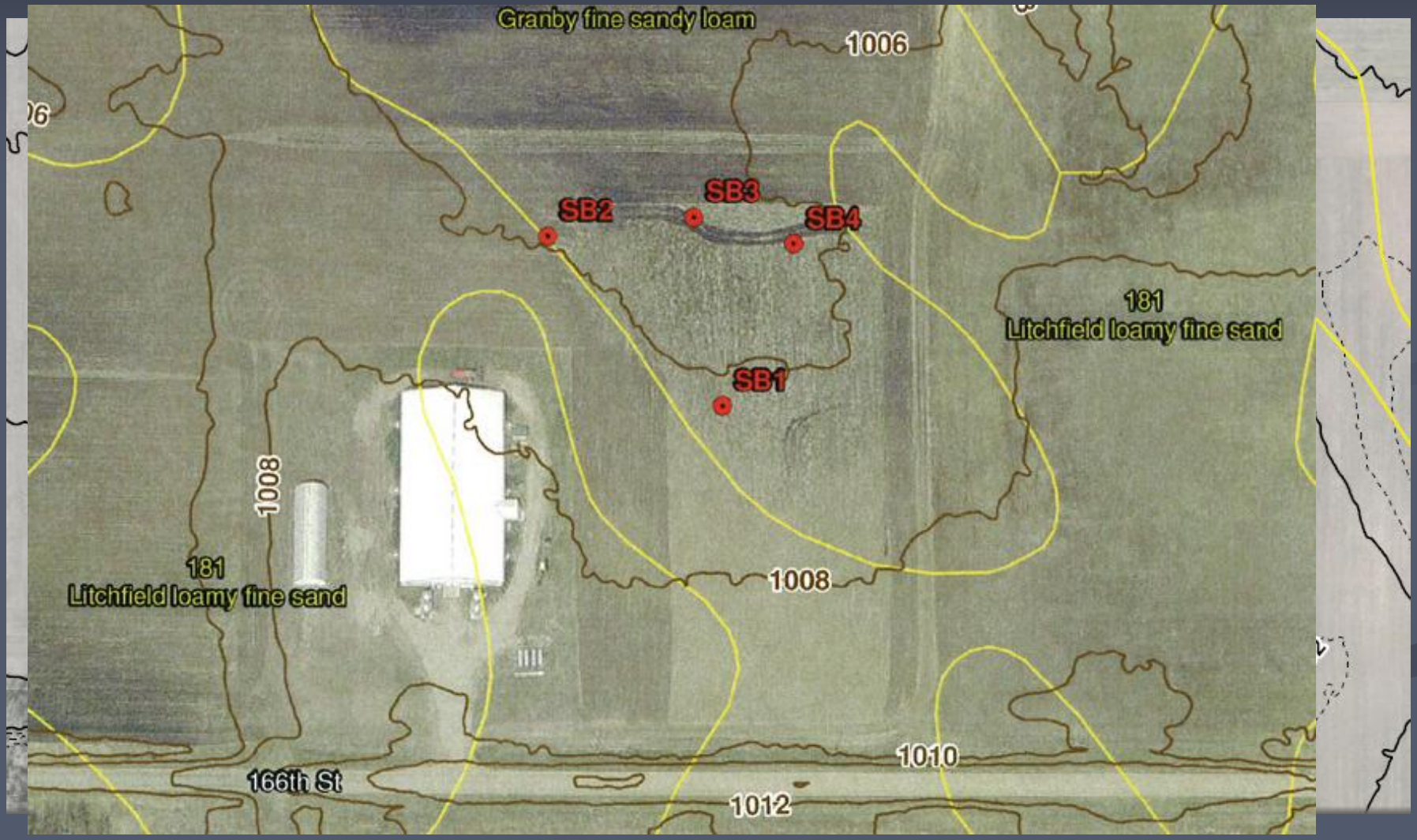
Replacement Site #1



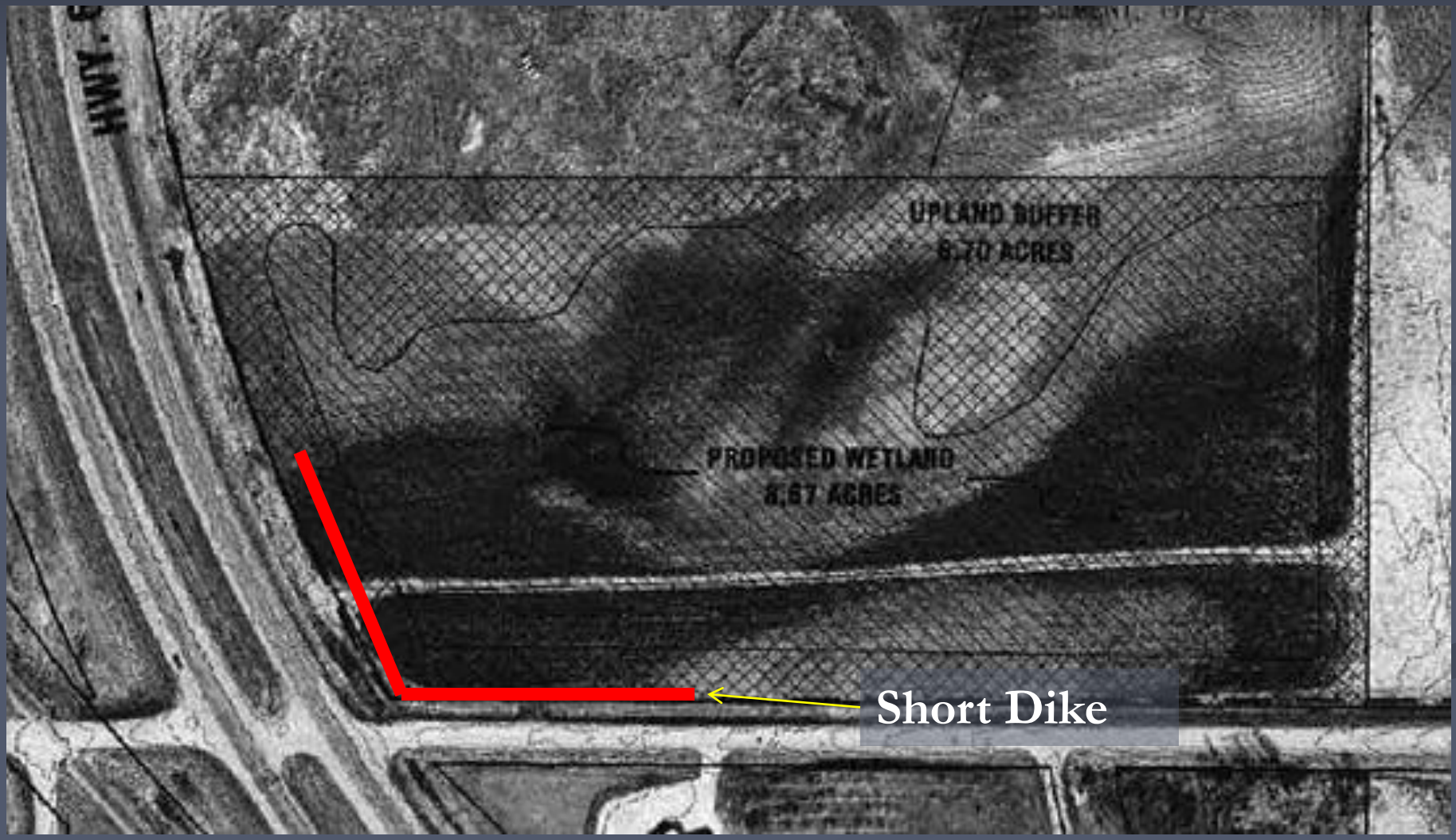

UPLAND BUFFER
BWSR U3 SEED - 3.14 AC
WETLAND
BWSR W5 SEED - 6.19 AC
*CLAY LINER
5.52 AC
WETLAND M
REQUIRED:
WETLAND M
PROVIDED:
*SEE CLAY LINER NOTES & DETAILS ON SHEET
0 40 80 120 160
Scale:
4:1 MAX SLOPE
PROPOSED CONTOUR, TYP
EXISTING CONTOUR, TYP
CONSERVATION EASEMENT, TYP.
CLAY BOUNDARY LINER, TYP.
UPLAND BUFFER 3.14 ACRES
PROPOSED WETLAND 5.00 ACRES (TOTAL)
RESTORE WETLAND 1.19 ACRES
PROPOSED WETLAND 5.00 ACRES (TOTAL)
WET
NOTE:
WHEN ENCOUNTERED D
EXCAVATION, AGRICULTU
SHALL BE DAYLIGHTED
WETLAND BASIN.


N
0 40 80 120 160
Scale:
UPLAND BUFFER
BWSR U3 SEED - 3.14 AC
WETLAND
BWSR W5 SEED - 6.19 AC
*CLAY LINER
5.52 AC
WETLAND MITIGATION
REQUIRED: 4.82 A
WETLAND MITIGATION
PROVIDED: 5.00 A
*SEE CLAY LINER NOTES & DETAILS ON SHEETS 3 & 4
NOTE:
WHEN ENCOUNTERED DURING EXCAVATION, AGRICULTURAL TILES SHALL BE DAYLIGHTED INTO THE WETLAND BASIN.
4:1 MAX SLOPE
PROPOSED CONTOUR, TYP
EXISTING CONTOUR, TYP
CONSERVATION EASEMENT, TYP
CLAY BOUNDARY LINER, TYP
UPLAND BUFFER 3.14 ACRES
PROPOSED WETLAND 5.00 ACRES (TOTAL)
RESTORE WETLAND 1.19 ACRES
PROPOSED WETLAND 5.00 ACRES (TOTAL)
12M
WET
PROPERTY BOUNDARY, TYP
4:1 Side slopes
Clay Liner
14+ Feet of excavation
Edge not consistent with naturally occurring wetlands

Options 2 and 3



Option 4



May 2010

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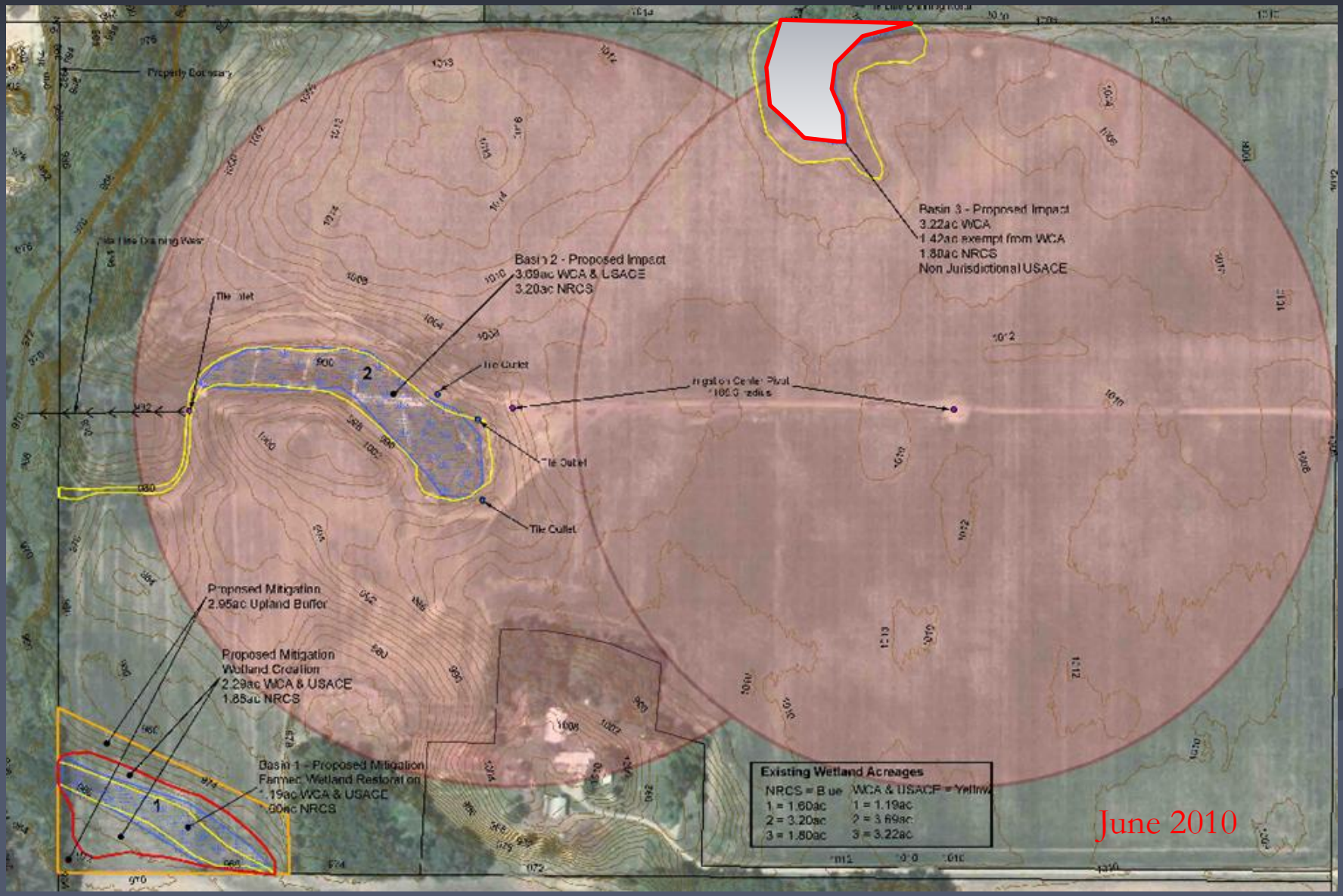
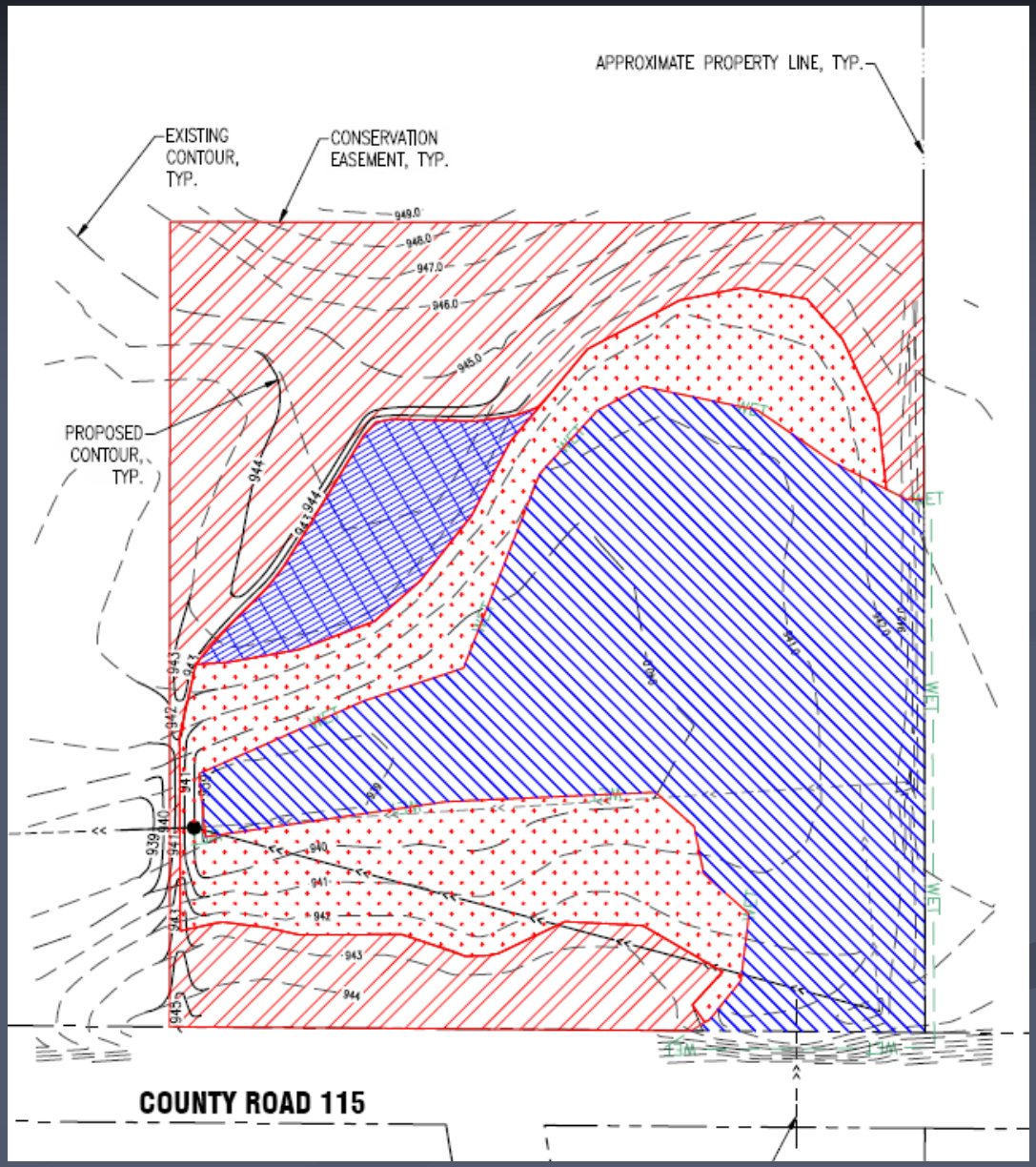


Final

- Final design was acceptable, not preferable
- Final construction occurred 2 years after original application
- Final price tag before construction exceeded $25,000



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The Review Process

Does it Really Need to be That Difficult?

The Review Process
Important Considerations

- Know your roles and responsibilities. Why we (you) should be concerned
- WCA rule and program guidance
- When and how to say no to bad projects or restoration strategies

The Review Process
Important Considerations

- Key restoration strategies (wetland and upland buffers)
- Applications should be deemed incomplete if required documents/information is not provided

The Review Process
General Review Components

The Review Process
General Review Components

- General Project Information
- Wetland Crediting
- Vegetation Establishment
- Engineering/Construction
- Monitoring/Outcomes

Agency Review Structure

- LGU (Decision Maker)
- TEP
  - LGU
  - SWCD
  - BWSR
  - Others
- Corps *(includes PCA and others)*

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- LGU (Decision Maker)
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  - Others
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BWSR Review Structure

Support – Staff Resources

BWSR Wetland Specialist (TEP)

Administrative

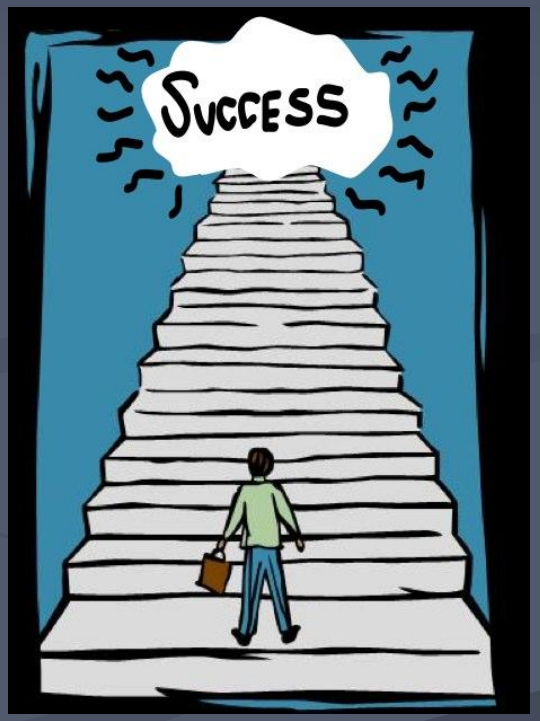
- Rule Compliance
- Legal

Technical

- Engineering
- Vegetation
- Hydrology/Hydrogeology
- Monitoring

The New - Three Step Application/Review/Decision Process *

- Scoping
- Concept Plan
- Application



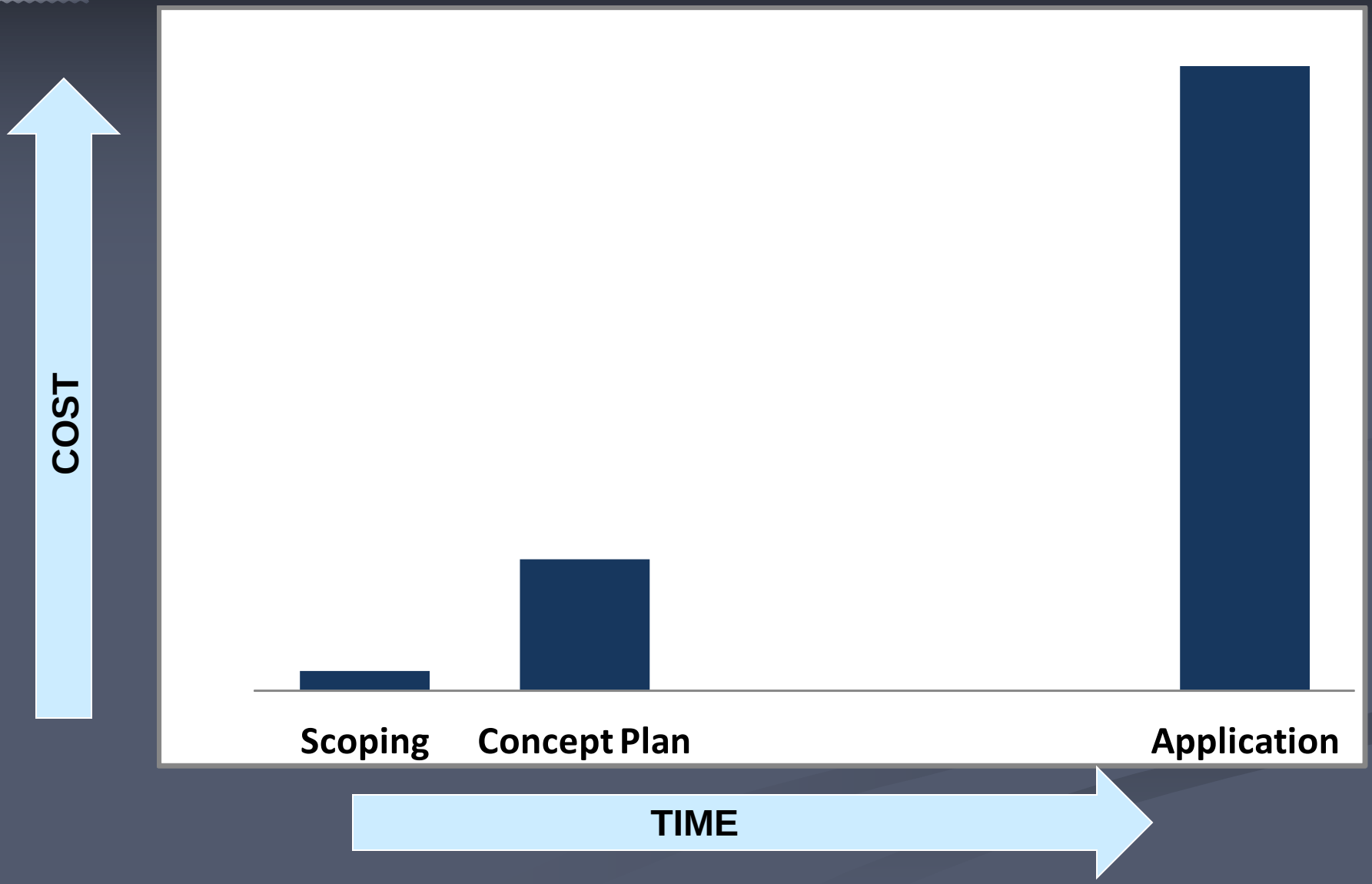
* Consistent with Corps Application Process

Wetland Banking

NEW Administrative Process
(Coming Soon)

Track 3 – Wetlands
Thursday
8:30 am – 10:00 am
Wetland Banking – What's New and Improved

Why the New Process?



The New - Three Step Application/Review/Decision Process

- Scoping
- Concept Plan
- Application

Scoping

- Early project review/evaluation
- Allows for a simple and inexpensive way to determine if project has potential to meet minimum program requirements
- No significant financial loss to applicant if project does not continue

Submittal Requirements

- Scoping Information Form
- Submittals/Documentation*
  - Air photos of site
  - Planned project area
  - Estimate of planned/existing wetland area(s)
  - History of land use (cropping)
  - Map/photo of existing drainage features/systems
  - Soils map
  - USGS Quad and/or LiDAR information

* With LGU/SWCD Assistance

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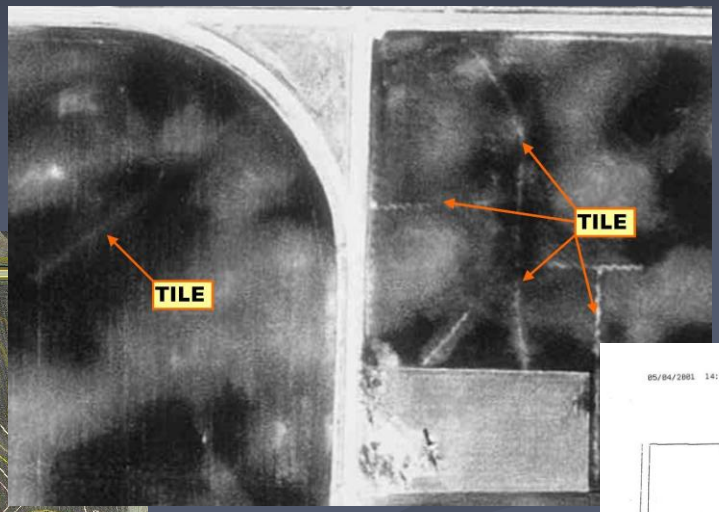
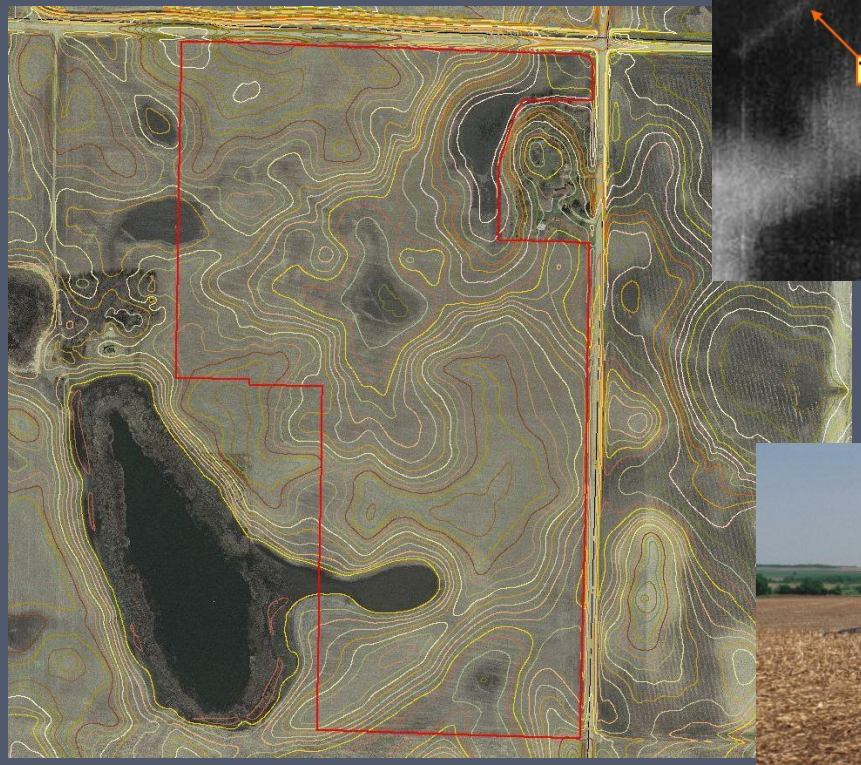
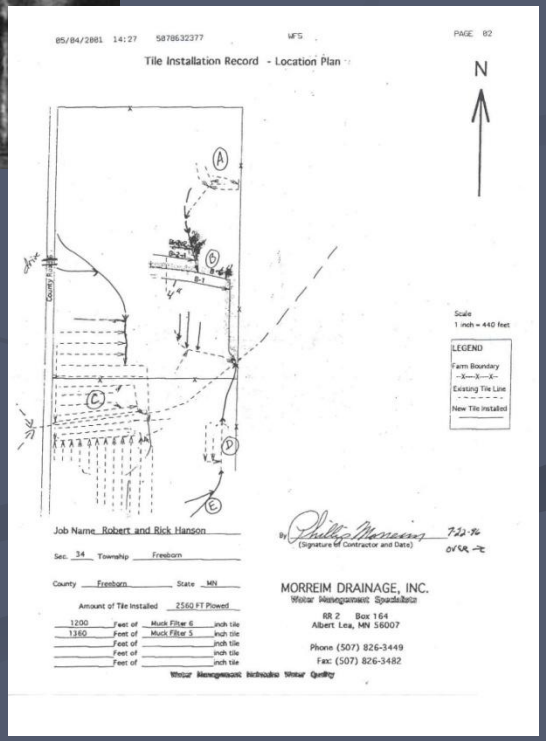
Scoping

Submittal Requirements







Review Outcomes

- **TEP Findings**
  - Address the potential for the site to:
    - *Meet minimum regulatory program/rule requirements*
    - *Be sustainable*
    - *Generate wetland credit*
  - Address concerns/problems

Review Outcomes

- Provide the pending bank/replacement site owner or sponsor with enough information for them to make an informed decision about whether to continue with the project

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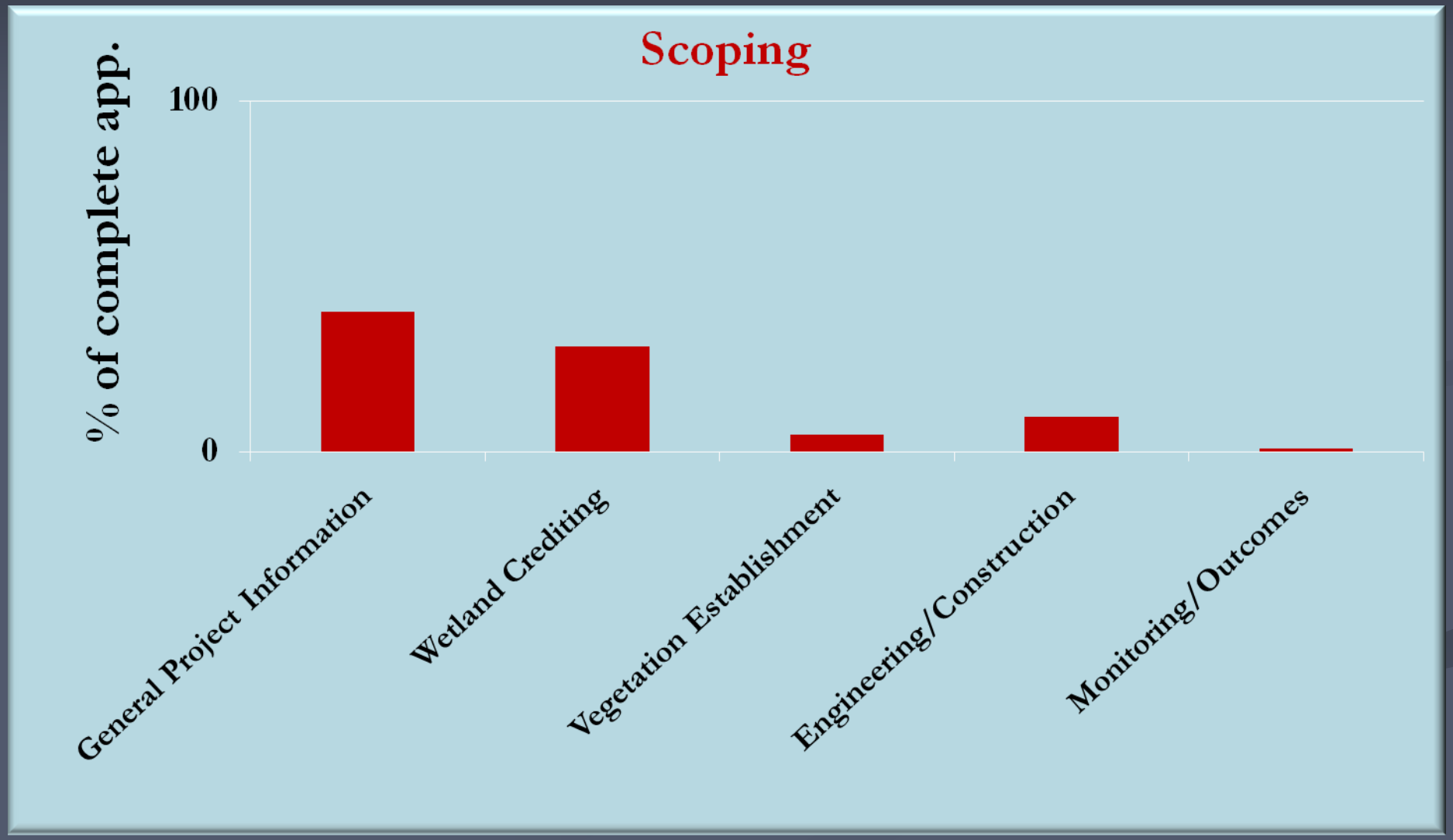
Review Components

Scoping



The New - Three Step Application/Decision Process

- Scoping
- Concept Plan
- Application

Concept Plan

- Similar to existing Part A
- Consistent with Corps Prospectus
- Not nearly as rigorous as a "full" application for wetland replacement

Concept Plan

- Will typically require the basic services of natural resource/engineering professionals
- Should provide enough information to allow a comprehensive project review without all the details

Concept Plan

- Provides opportunity to review general plan concepts and to discuss and get changes/improvements made without adding significant project (consultant) costs

Submittal Requirements

- Concept Plan Information Form
- Submittals/Documentation
  - *Written Narrative*
  - *Maps, plans, and photos*

Submittal Requirements

- **Written Narrative**
  - Summary of existing conditions
    - *Land use, vegetation, drainage/ hydrology alterations, wetlands, etc.*
  - Summary/overview of proposed project
  - General summary of design/restoration goals
    - *Ecological suitability, sustainability, vegetation, construction*

Submittal Requirements

- **Written Narrative**
  - General summary of anticipated wetland credits
    - *Type of credit actions (rule), acres, credit amount, wetland types, cropping history, etc.*
  - Discussion of potential problems or issues

Submittal Requirements

- **Maps, Plans, and Photos**
  - Air photo of planned project area/boundary
  - Soils information/map
  - Map/photo of existing wetland areas
  - Concept plan map
    - *Topography, drainage features, roads, utilities, property boundaries, project boundary, planned restoration/construction features, planned grading work, etc.*
  - Others (as appropriate)

Review Outcomes

- **TEP Findings**
  - Comprehensive and informative
  - Provide guidance, suggestions, alternatives, etc.
  - Address concerns/problems

Review Outcomes

- Provide an appropriate amount of information allowing the owner/sponsor to make an informed decision about whether to proceed to the full application phase

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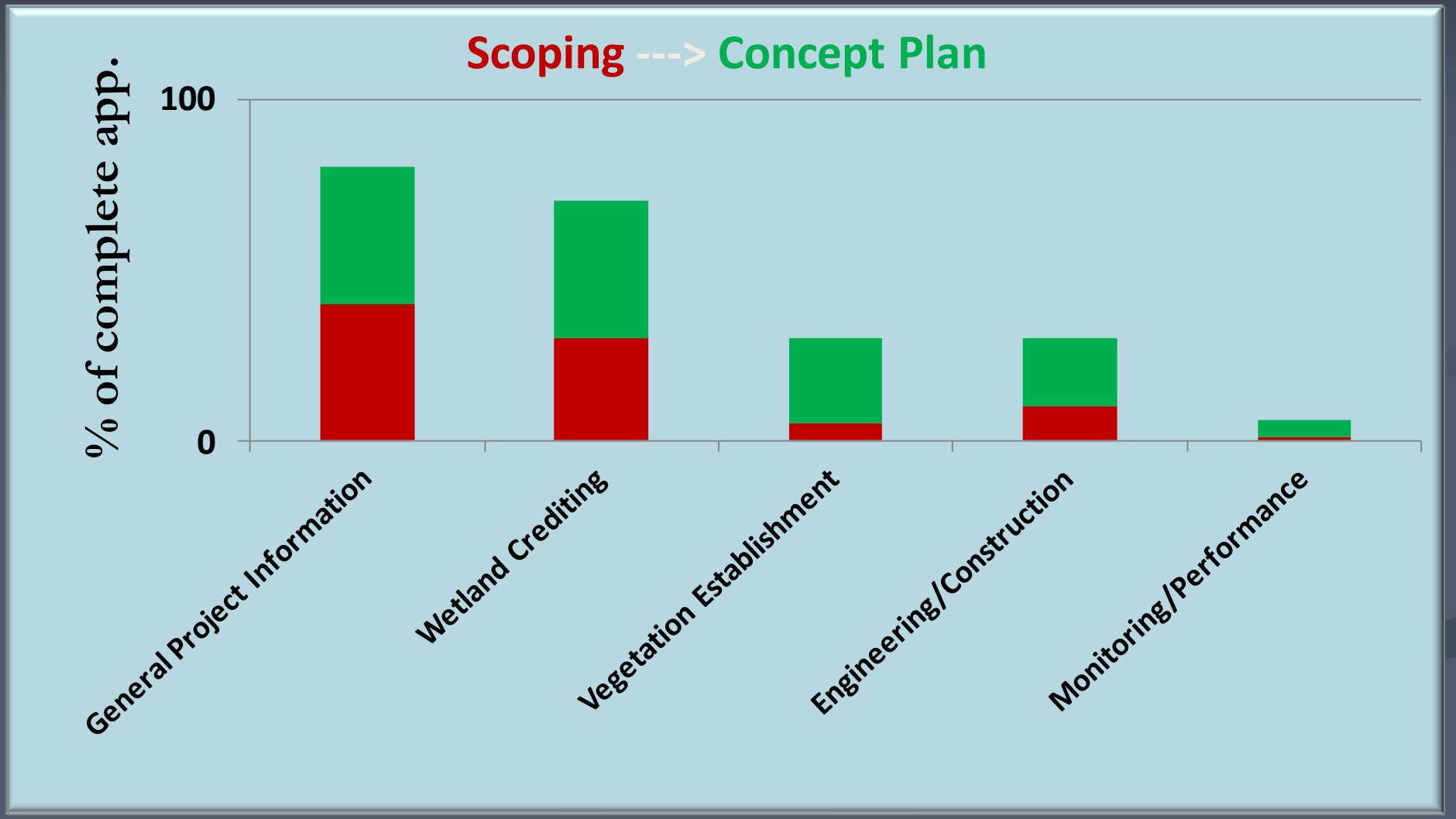
Concept Plan Review Components



The New - Three Step Application/Decision Process

- Scoping
- Concept Plan
- Application

Application for Replacement Wetlands

- Similar requirements to current Part A and B of Banking Program *(hopefully more streamlined)*
- Includes all information previously provided in Scoping and Concept Plan phases

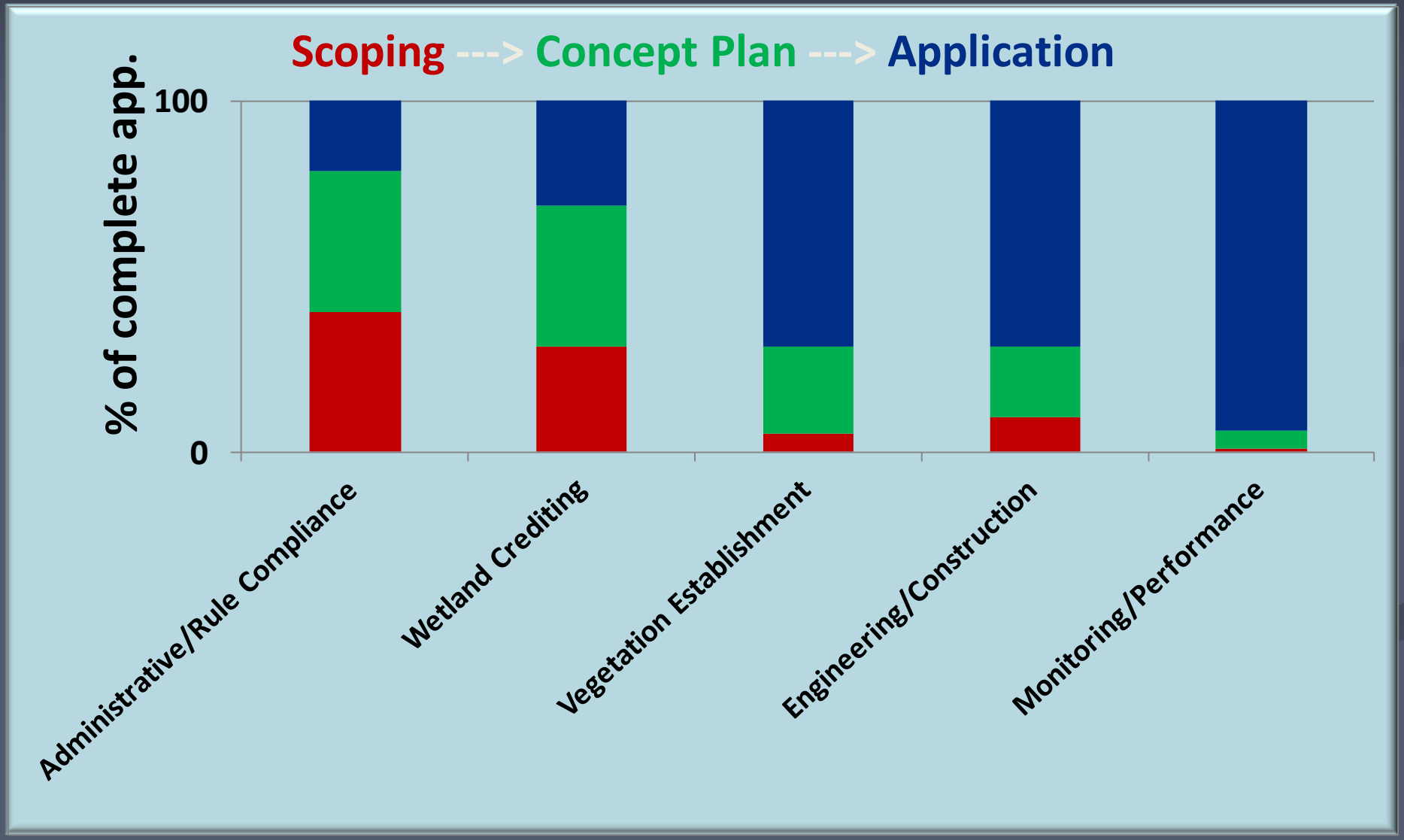
Application for Replacement Wetlands

- Prior LGU/TEP comments, recommendations, and findings should improve quality of applications
- 15.99 Clock Starts Ticking

Review Outcomes

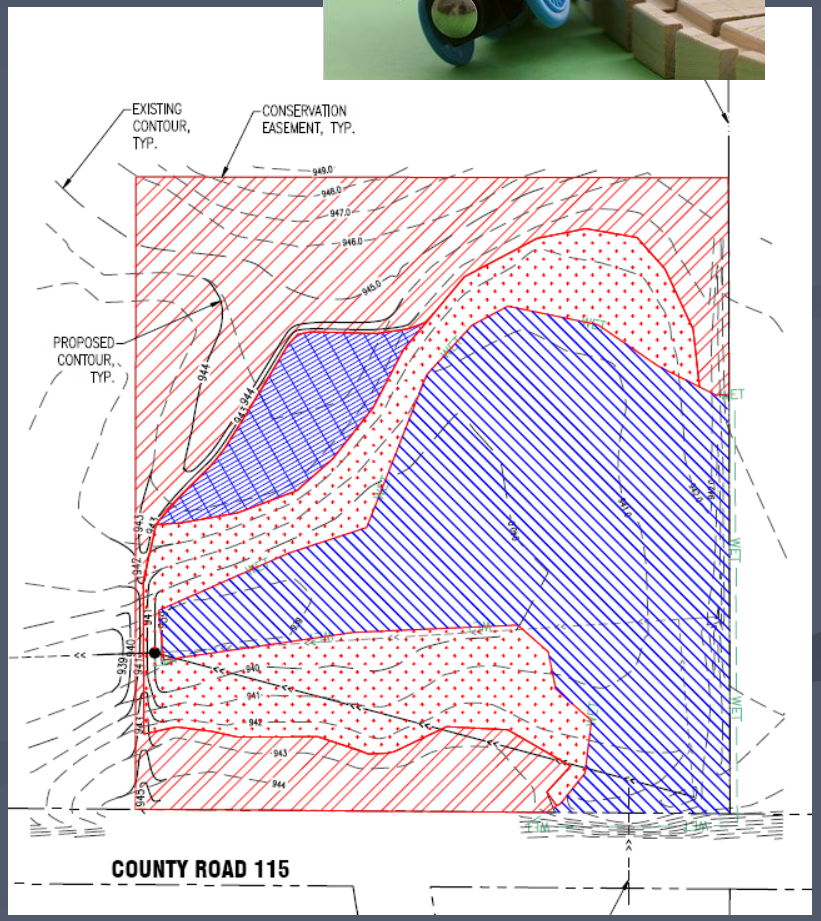
- TEP Findings
- LGU Decision
  - Deem Incomplete
  - Deny
  - Approve
  - Approve with Conditions

Application Review Components



Example Replacement Plan

- 4 complete applications submitted
- Only 1 was approved
- Under current process, "pre-application meeting" is highly encouraged
- Pre-meetings or pre-applications could have saved $$$$$



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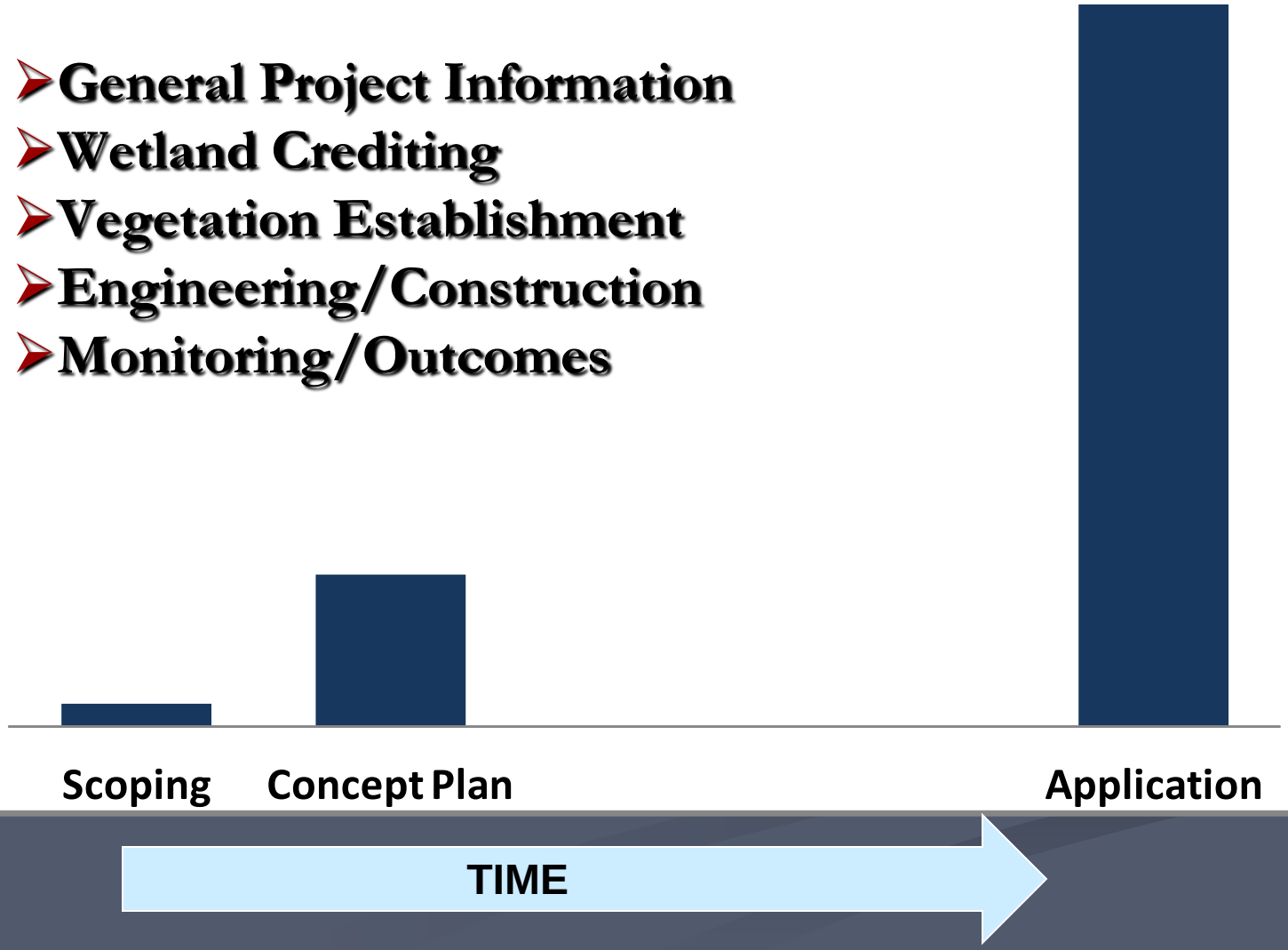
General Review Components

- General Project Information
- Wetland Crediting
- Vegetation Establishment
- Engineering/Construction
- Monitoring/Performance

The New Process?

- General Project Information
- Wetland Crediting
- Vegetation Establishment
- Engineering/Construction
- Monitoring/Outcomes



General Review Components

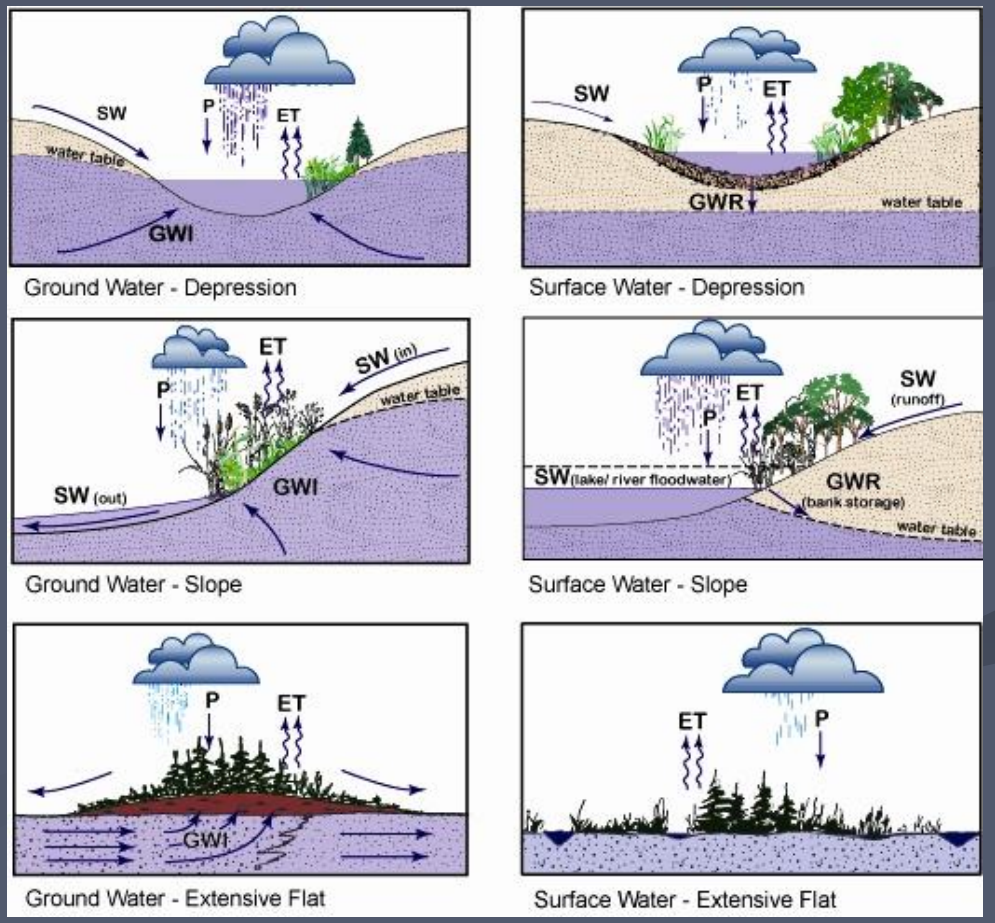
- *General Project Information*
- Wetland Crediting
- Vegetation Establishment
- Engineering/Construction
- Monitoring/Performance

Submittal Requirements

- Revised general project information from Concept Plan (more comprehensive)
- Information on property ownership
- Discussion of legal encumbrances
- Drainage/flowage easements
- Project area - size and boundary map

Submittal Requirements

- Ecological Suitability
- Wetland Types



Submittal Requirements

- How and when is everything going to be accomplished?
- Credit Allocation schedule
- Financial Assurance

General Review Components

- General Project Information
- *Wetland Crediting*
- Vegetation Establishment
- Engineering/Construction
- Monitoring/Performance

General Project Information

- Actions eligible for credit
  - Discussion
  - Map of credit areas
  - Tables

Restoration of Completely Drained Wetlands

- Was it really drained?
- Is it documented?
- Is it really a restoration?

Restoration of Partially Drained Wetlands

- Is there a delineation with it?
- Did they include cropping history?
- If not cropped, what makes it partially drained?
- Is the plan really to restore the natural hydrology of the site?

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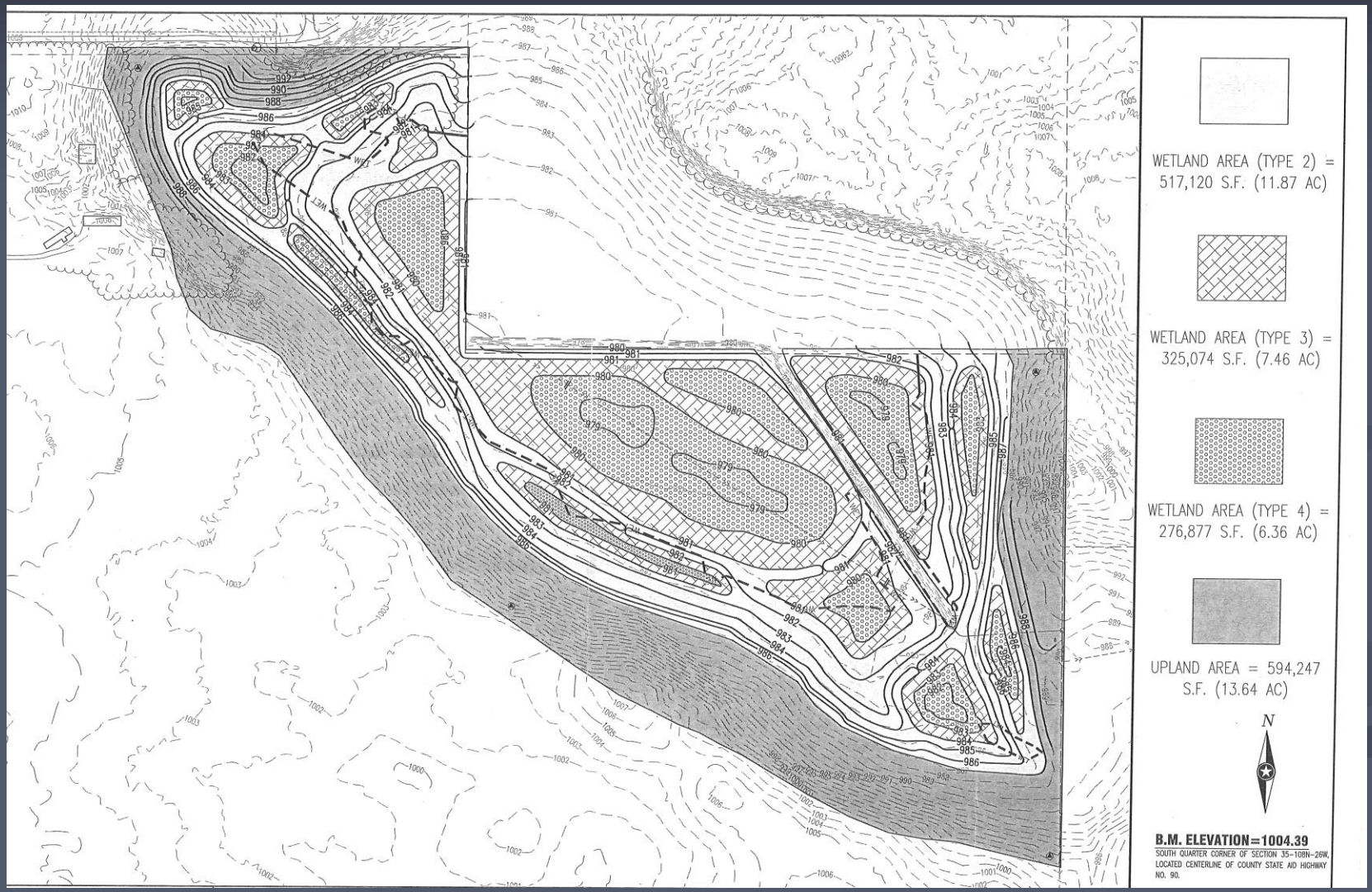
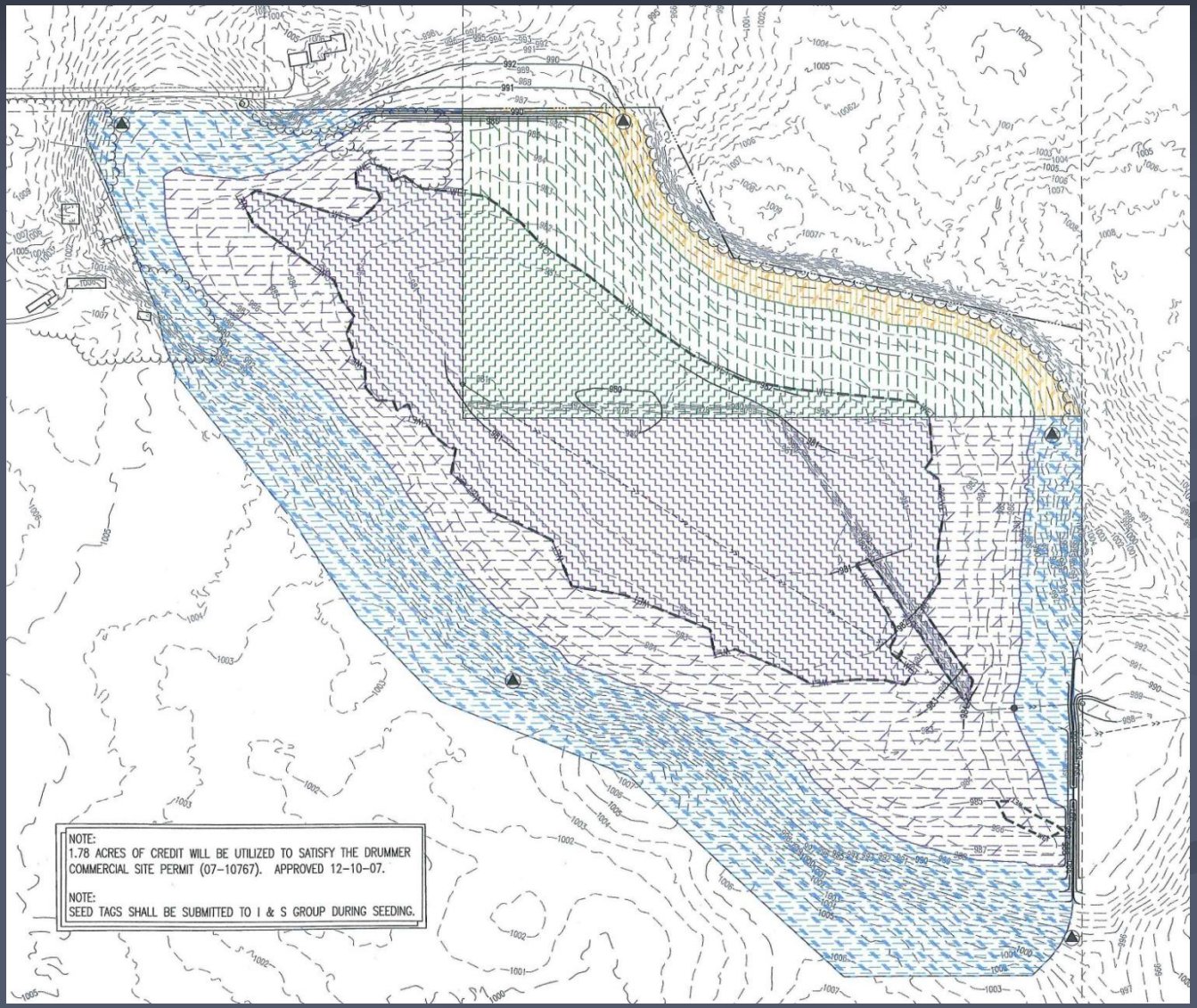
Wetland Crediting



Wetland Crediting

Wetland Crediting



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Wetland Crediting

Vegetative Restoration of Farmed Wetlands

- Not vegetative restoration of drained/degraded wetlands
- Needs cropping history of at least 10 of the last 20 years.
- BSA's 2, 3, and 4, can allow up to 90% - again depending on crop history.

Wetlands Restored via Conservation Easements

- Needs to meet current engineering and vegetation standards
- Contract or Easement needs to have expired or be terminated
- Meant to be turn key
- 75% credit
- Other actions eligible may be a better alternative

Wetland Crediting

Creations

- Unless there are few other opportunities in the BSA, typically discouraged. Especially for banking.
- Mineral extraction activity sites need to meet design standards.
- Water quality treatment systems (stormwater ponds)

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Wetland Crediting

ENRV Restoration & Protection of Exceptional Natural Resource Value

- This can be very complicated
- Requires concurrence from the TEP
- Utilize the guidance on BWSR website

Preservation

- Only for greater than 80 counties
- TEP must determine that the site has a high probability of being degraded or impacted in the future.
- See guidance on BWSR website

General Review Components

- General Project Information
- Wetland Crediting
- *Vegetation Establishment*
- Engineering/Construction
- Monitoring/Performance

Scoping Phase

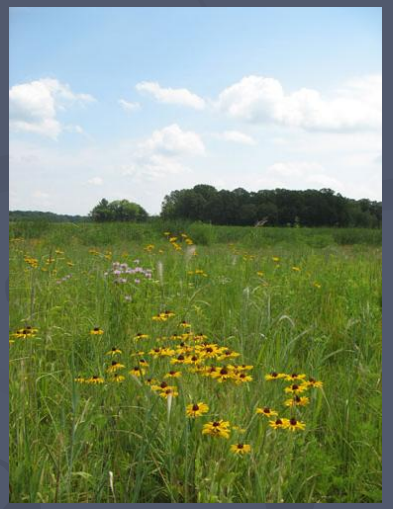
- Feasibility of meeting project vegetation goals
- Long–term threats

Concept Plan Phase

- Problematic invasive species
- Percent cover of invasive species
- Desirable native species and potential seedbank
- General plans for site preparation, planting and project maintenance

Application Requirements

- Site Preparation
- Seed Mixes and Plant Materials
- Seeding/Planting Zone Map
- Seeding/Planting Methods
- Vegetation Maintenance
- Schedule of Activities



•Present and Past Site Conditions, Project Goals and performance standards should be covered in other portions of the plan

Application Requirements

- *Site Preparation*
- Seed Mixes and Plant Materials
- Seeding/Planting Zone Map
- Seeding/Planting Methods
- Vegetation Maintenance
- Schedule of Activities

Site Preparation

What information should be included?

- Transition from agriculture or other uses
- Invasive species control (herbicide application, prescribed burn, etc.)
- Soil and seedbed preparation plans (disking, raking, mowing, cutting etc.)
- Will temporary cover crops be used?
- Schedule for site preparation/seeding

Application Requirements

- Site Preparation
- *Seed Mixes and Plant Materials*
- Seeding/Planting Zone Map
- Seeding/Planting Methods
- Vegetation Maintenance
- Schedule of Activities

Seed Mixes and Plant Materials

What information should be included?

- The seed mixes and plant materials to be used for the project
- Seed or plant supplier and origin of materials
- Plant materials should correspond to information on the seeding/planting zone map

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Vegetation Establishment

Seed Mixes and Plant Materials

Table 1 – Seed zone areas and plant materials

Planting Zone	Area Planted (Acres)	Seed/Plant Mix	Seeding/Planting Method	Seed/Plant Rate (PLS seed/Acre)	Total Seed Required
Wet Meadow	14	34-271	Broadcast Seeding	12 lbs. per acre	168 lbs.
Wet Meadow – Planted with Locally Collected Seed	7	Site Collected Seed	Broadcast Seeding	20 lbs. per acre	140 lbs.
Shallow Marsh (ten-foot band around pool)	2	34-181	Broadcast Seeding	5 lbs. per acre	10 lbs.
Wild Rice	4	Wild Rice	Broadcast	5	20 lbs
Emergent Plugs	420 emergent plants – Approximately 40 each of Slough Sedge, Three-square Bulrush, River Bull Rush, Giant Bur Reed, and Soft Stem Bull Rush				
Zone 3 - Upland	41.5	35-541	Drill Seeding	12 lbs. per acre	498 lbs.
Total	70.5				

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Vegetation Establishment

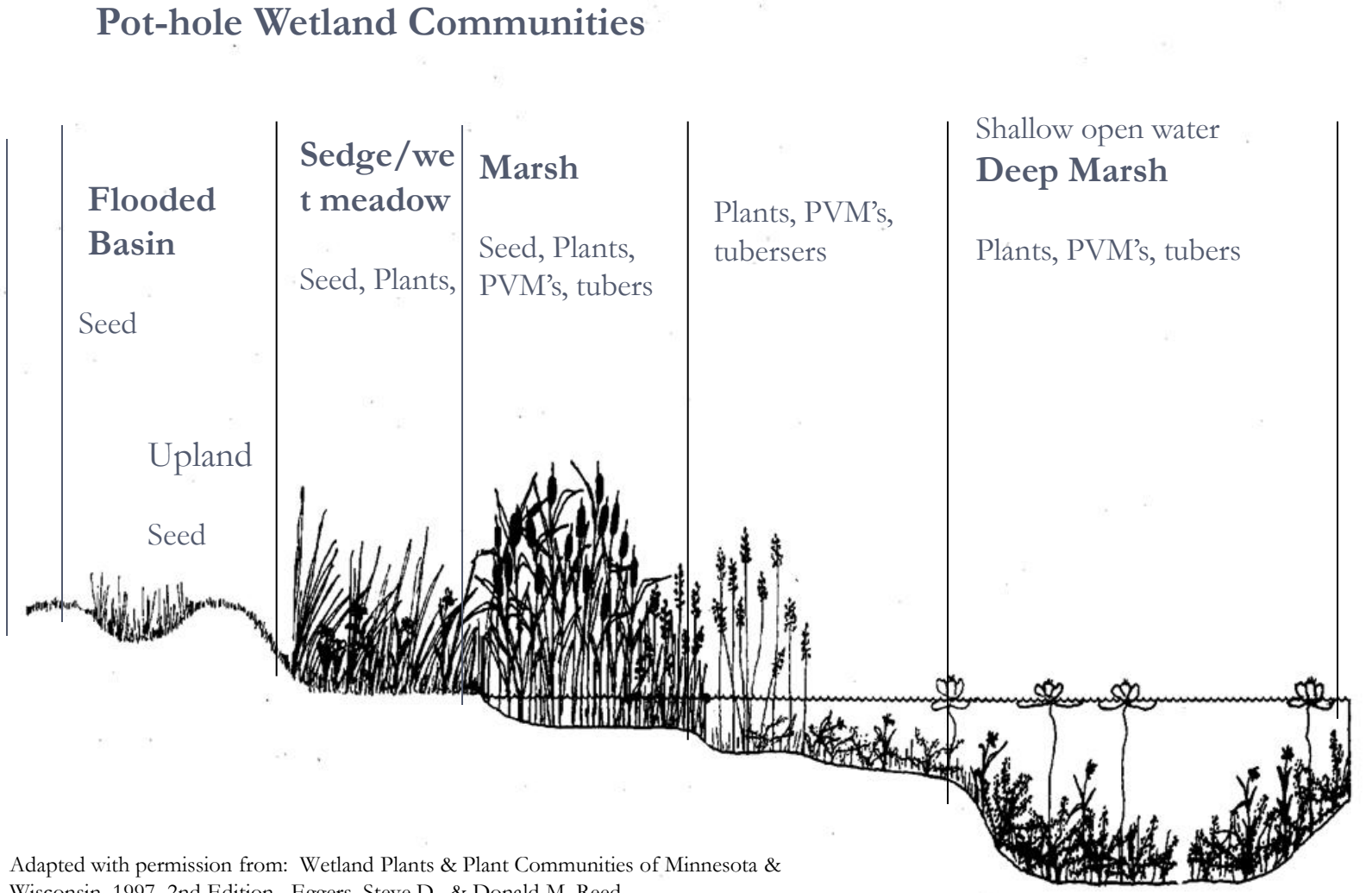
Seed Mixes and Plant Materials

34-181 **Emergent Wetland**

Common Name	Scientific Name	Rate (kg/ha)	Rate (lb/ac)	% of Mix (% by wt)	Seeds/ sq ft
American slough grass	*Beckmannia syzigachne*	0.78	0.70	14.07%	12.92
tall manna grass	*Glyceria grandis*	0.28	0.25	4.98%	6.40
rice cut grass	*Leersia oryzoides*	0.34	0.30	5.93%	3.70
	Total Grasses	**1.40**	**1.25**	**24.98%**	**23.02**
river bulrush	*Bolboschoenus fluviatilis*	0.85	0.76	15.20%	1.20
bristly sedge	*Carex comosa*	0.20	0.18	3.63%	2.00
lake sedge	*Carex lacustris*	0.07	0.06	1.19%	0.24
tussock sedge	*Carex stricta*	0.04	0.04	0.77%	0.75
least spikerush	*Eleocharis acicularis*	0.11	0.10	1.94%	2.50
marsh spikerush	*Eleocharis palustris*	0.11	0.10	2.03%	1.90
Torrey's rush	*Juncus torreyi*	0.04	0.04	0.85%	25.00
Three-square bulrush	*Schoenoplectus pungens*	0.26	0.23	4.54%	1.00
soft stem bulrush	*Schoenoplectus tabernaemonta*	0.49	0.44	8.78%	5.00
woolgrass	*Scirpus cyperinus*	0.06	0.05	1.02%	32.00
	Total Sedges and Rushes	**2.24**	**2.00**	**39.95%**	**71.59**
Sweet flag	*Acorus americanus*	0.31	0.28	5.53%	0.67
common water plantain	*Alisma triviale*	0.45	0.40	8.00%	9.70
marsh milkweed	*Asclepias incarnata*	0.31	0.28	5.67%	0.50
broad-leaved arrowhead	*Sagittaria latifolia*	0.34	0.30	6.07%	6.80
giant bur reed	*Sparganium eurycarpum*	0.55	0.49	9.80%	0.09
	Total Forbs	**1.96**	**1.75**	**35.07%**	**17.76**
	Totals:	**5.60**	**5.00**	**100.00%**	**112.37**

Vegetation Establishment

Seed Mixes and Plant Materials



Adapted with permission from: Wetland Plants & Plant Communities of Minnesota & Wisconsin, 1997, 2nd Edition. Eggers, Steve D., & Donald M. Reed.

Seed Mixes and Plant Materials

- Pool elevation - seed a narrow band of emergent mix (10 feet wide) straddling pool elevation. Live plants will aid establishment.

- Pool elevation to plus 1-2 feet (saturated soils) - seed wet meadow mix

- Pool elevation plus 2 feet and higher – seed upland mixes

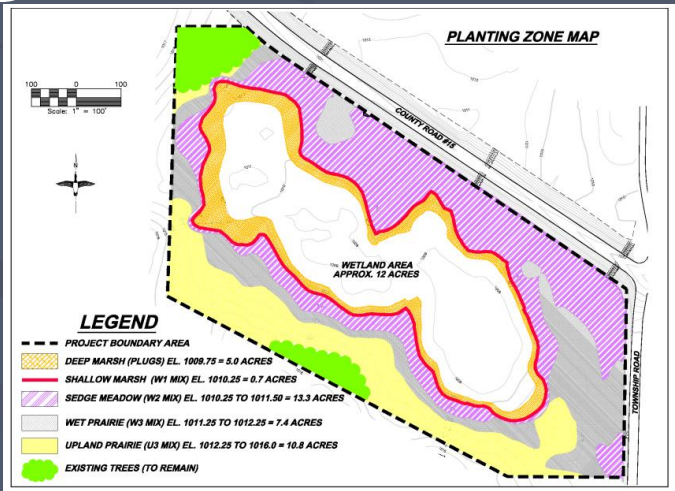
Application Requirements

- Site Preparation
- Seed Mixes and Plant Materials
- *Seeding/Planting Zone Map*
- Seeding/Planting Methods
- Vegetation Maintenance
- Schedule of Activities

Seeding and Planting Zone Map

What should be included/shown?

- Existing trees, areas of vegetation to preserve
- Intended location of seed mixes
- Location of other plantings
- Map key



Application Requirements

- Site Preparation
- Seed Mixes and Plant Materials
- Seeding/Planting Zone Map
- *Seeding/Planting Methods*
- Vegetation Maintenance
- Schedule of Activities

Seeding/Planting Methods

What information should be included?

- What is the implementation sequence?
- How will seed/plants be installed?
- Planting rates

Seeding/Planting Methods

- Fall installation – Seed is stratified naturally over winter and will germinate in spring
- Spring installation – Best time for grass species
- Mid-summer installation – not recommended

Seeding/Planting Methods

Preparation for seeding

The ideal seedbed can vary depending on the seeding equipment to be used. For seed drills a firm (but not overly compacted) seedbed is needed

A rougher seedbed can work for broadcast seeding but higher rates are typically needed

Application Requirements

- Site Preparation
- Seed Mixes and Plant Materials
- Seeding/Planting Zone Map
- Seeding/Planting Methods
- *Vegetation Maintenance*
- Schedule of Activities

Vegetation Maintenance

What information should be included?

- Activities planned over 5-year est. period
- Species to be monitored and controlled
- How will problem species be controlled?
- When will activities be conducted?
- How and when will site inspection occur?
- Contingency plan for corrective measures

Vegetation Maintenance

Weed Control Needs

Aggressive weed management is important during the establishment phase

Minnesota Wetland Restoration Guide Vegetation Section: http://www.bwsr.state.mn.us/native_vegetation/index.html

Scheduled Activities

What information should be included?

- Schedule for seeding, planting and maintenance practices
- Practices shown by month or season

Scheduled Activities

Schedule of site preparation activities

• September 1	Plow, disk, and harrow the entire site
• September 6	Begin Construction
• September 20	Inspect the site for invasive or exotic plant species
• September 25	Apply control measures to eradicate undesirable species.
• October 5	Seed winter wheat cover crop upon completion of construction
• May 2012	Treat weeds if necessary
• Early June 2009	Broadcast native seed mixes
• Etc……	

General Review Components

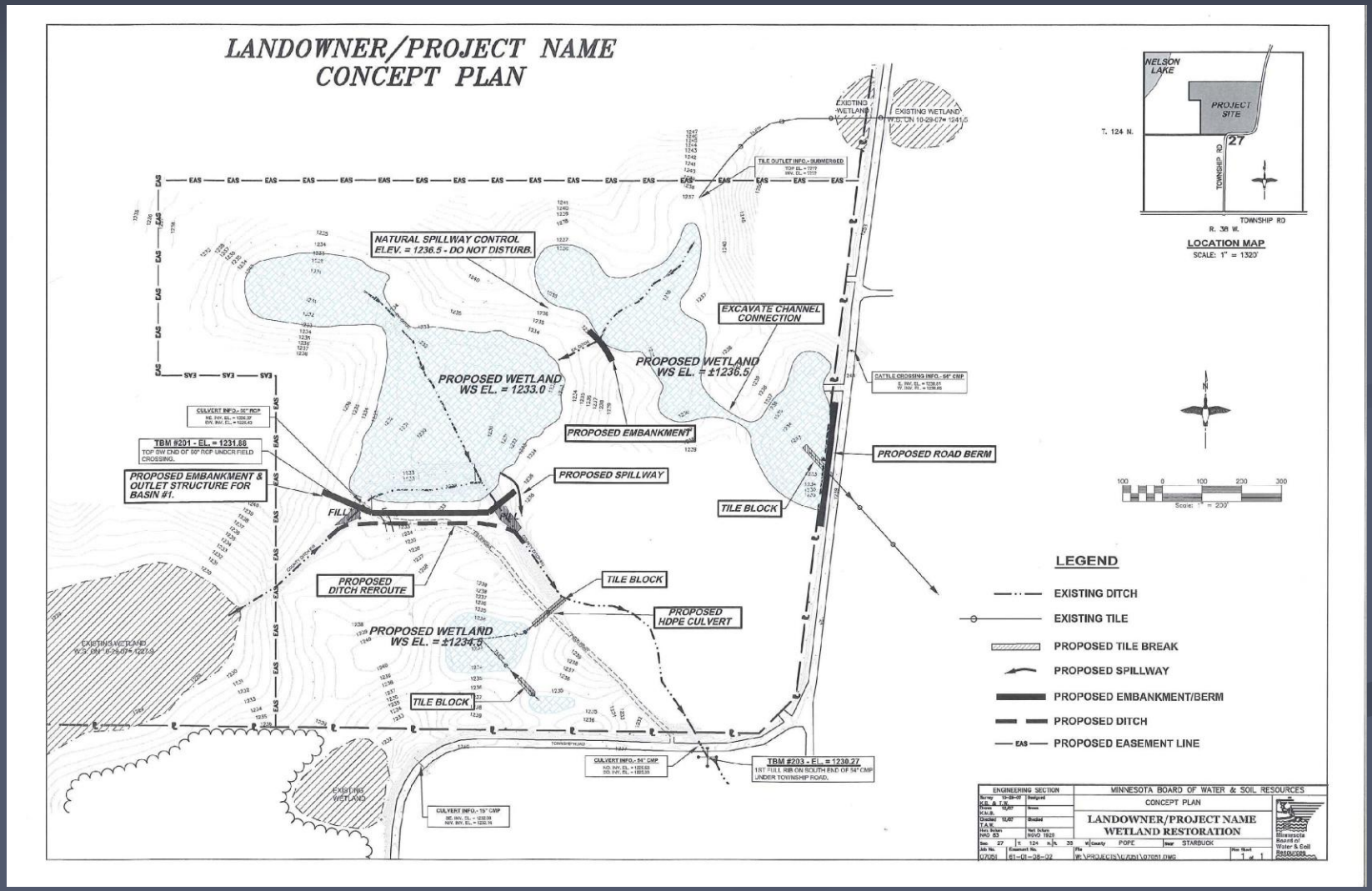
- General Project Information
- Wetland Crediting
- Vegetation Establishment
- *Engineering/Construction*
- Monitoring/Performance

Scoping Phase

- Scope of altered/drained wetlands
- Feasibility of planned restorations/construction
- Offsite flooding or drainage impacts

Engineering/Construction

Concept Plan Phase



Minnesota Board of Water & Soil Resources

Engineering/Construction

Application Requirements

- Design Report
- Construction Plans
- Construction and Material Specifications
- Construction Inspection and Certification Plan

Minnesota Board of Water & Soil Resources

Engineering/Construction

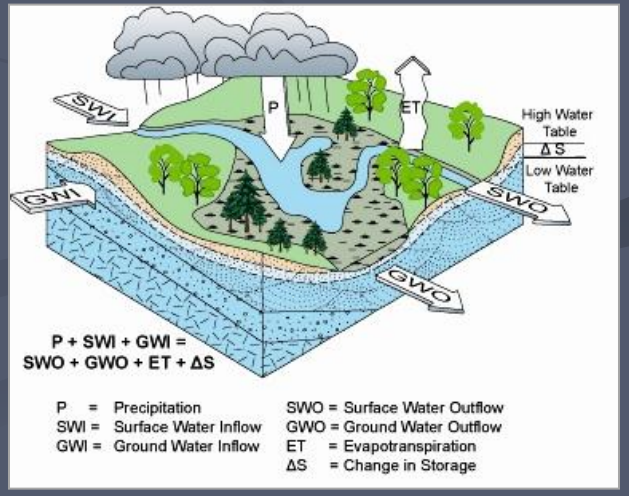
Application Requirements

- ***Design Report***
- **Construction Plans**
- **Construction and Material Specifications**
- **Construction Inspection and Certification Plan**

Engineering/Construction

Design Report

- Description of proposed project
- Define the hydrologic capabilities of the site
- Report of subsurface investigations
- Hydrologic/hydraulic evaluations
- Estimate of construction costs

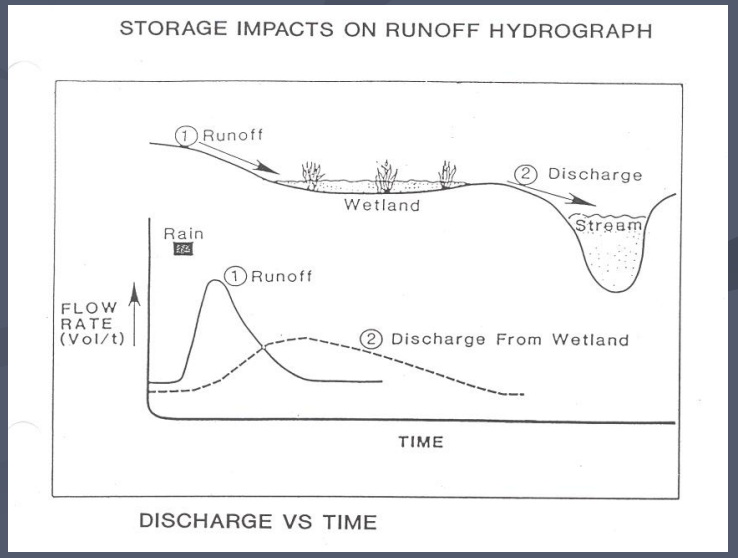


Minnesota Board of Water & Soil Resources

Engineering/Construction

Design Report

- Demonstrate benefits of the project
- Show there will be no negative upstream or downstream impacts
- Used to determine size (capacity) of outlet structures



Minnesota Board of Water & Soil Resources

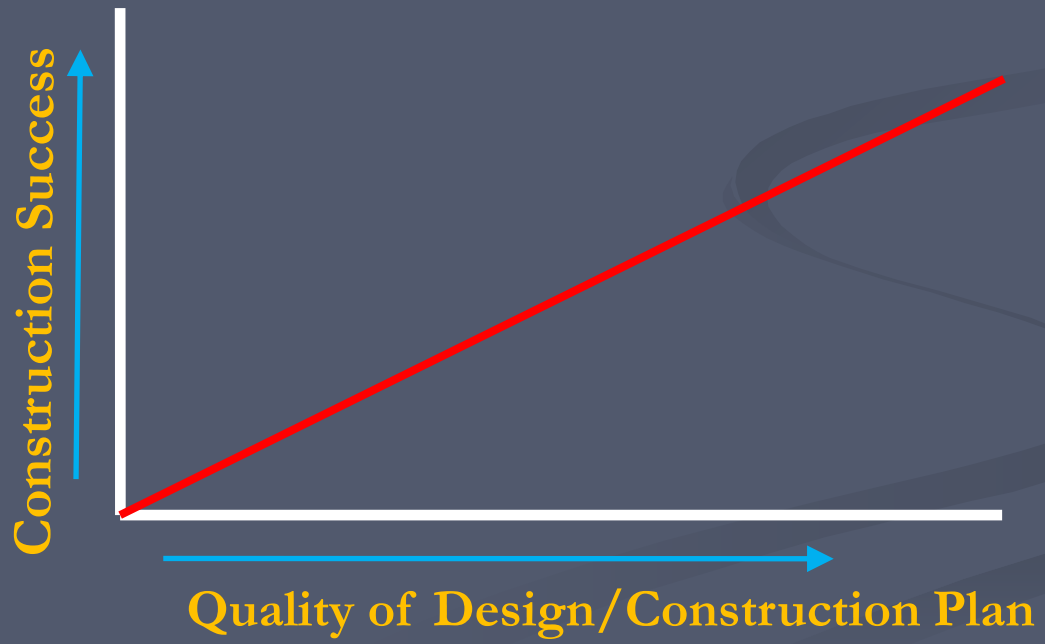
Engineering/Construction

Application Requirements

- Design Report
- *Construction Plans*
- Construction and Material Specifications
- Construction Inspection and Certification Plan

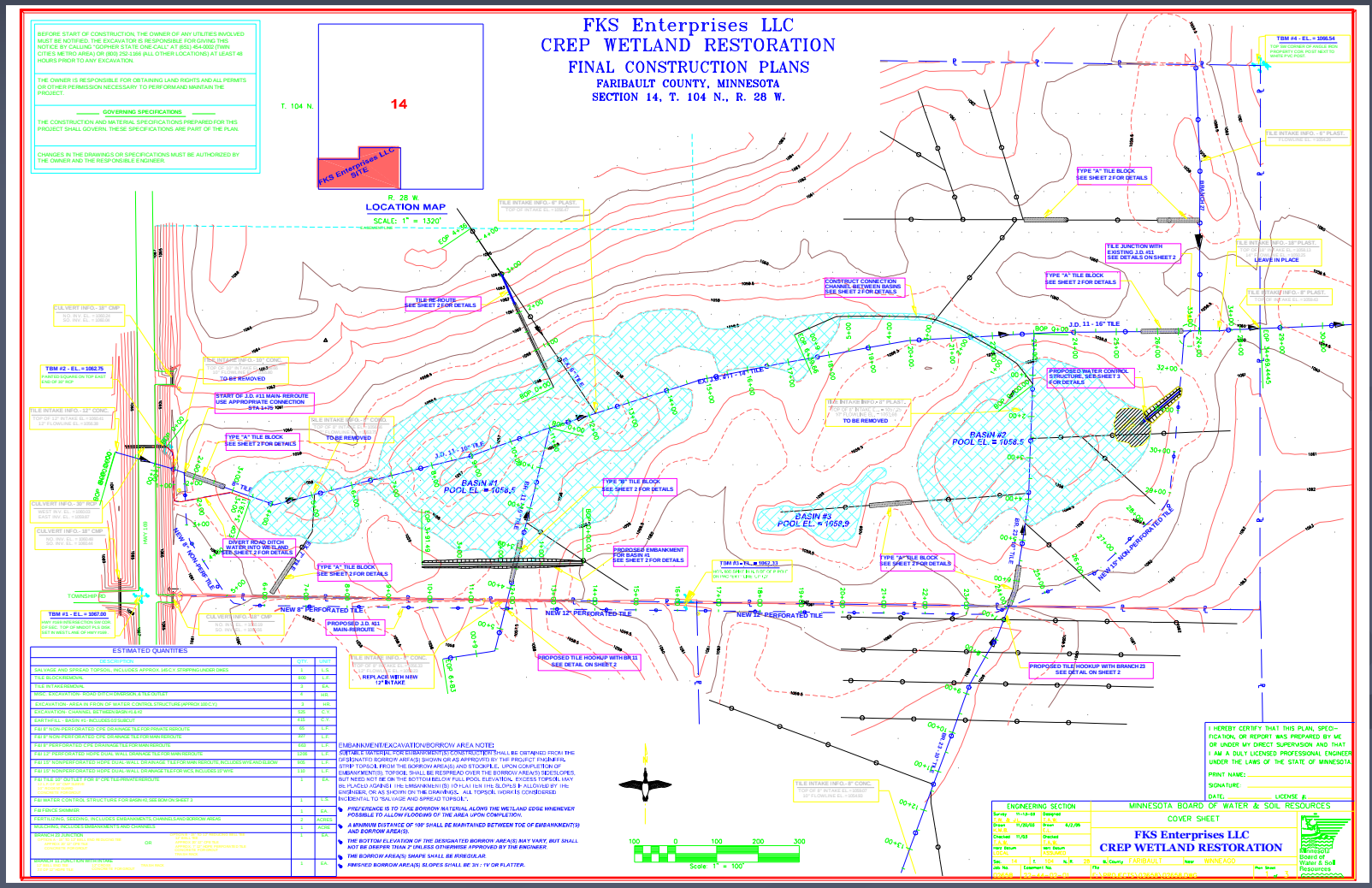
Construction Plans

- Detailed plan view showing all construction features
- Construction details



Engineering/Construction

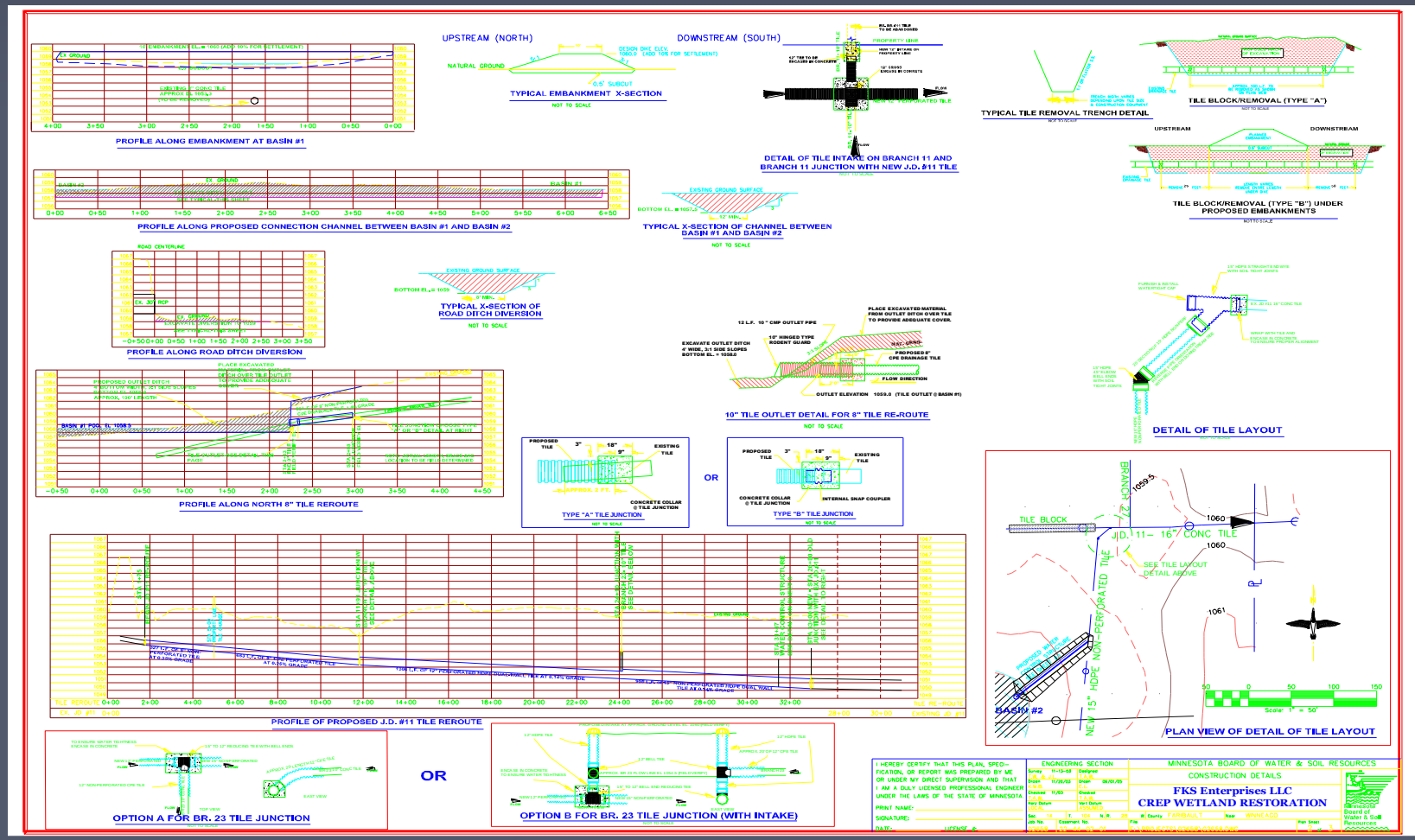
Construction Plans



Engineering/Construction

Construction Plans

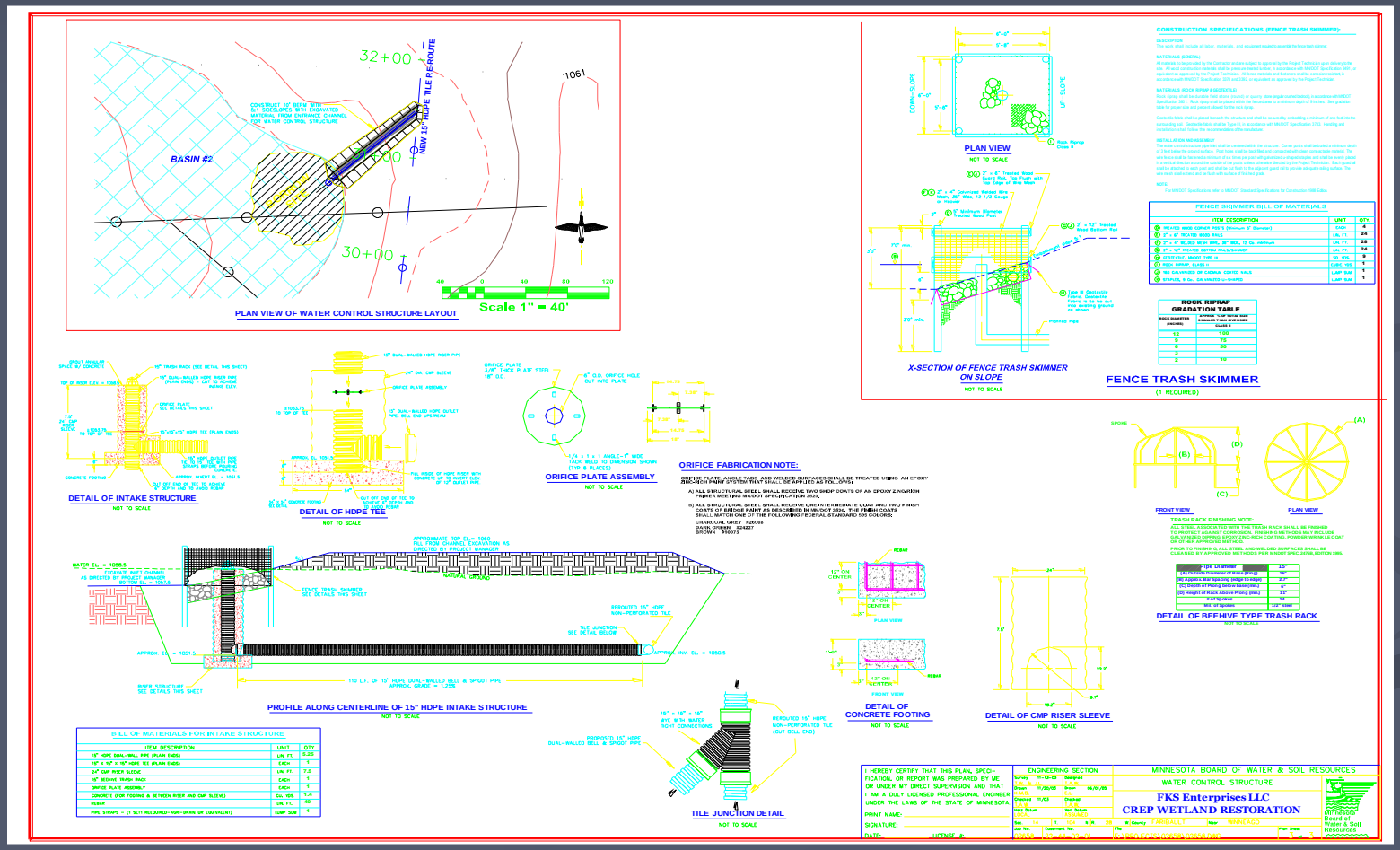
- Profiles, Cross Sections and Misc. Details



Engineering/Construction

Construction Plans

- Structure Details



Minnesota Board of Water & Soil Resources

Construction Plans

Engineering certification of construction plan and construction specifications (per MN Statutes § 326.02.)

I HEREBY CERTIFY THAT THIS PLAN, SPECI-
FICATION; OR REPORT WAS PREPARED BY ME
OR UNDER MY DIRECT SUPERVISION AND THAT
I AM A DULY LICENSED PROFESSIONAL ENGINEER
UNDER THE LAWS OF THE STATE OF MINNESOTA.

PRINT NAME: _____

SIGNATURE: _____

DATE: _____ LICENSE #: _____

Minnesota Board of Water & Soil Resources

Engineering/Construction

Application Requirements

- Design Report
- Construction Plans
- *Construction and Material Specifications*
- Construction Inspection and Certification Plan

Engineering/Construction

Construction & Material Specifications

CONSTRUCTION SPECIFICATIONS

Larry Schram CREP Wetland Restoration

Swift County

File No. 76-36-01-01
Project No. 01053

Prepared by the

Minnesota Board of Water and Soil Resources

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

Print Name: Thomas A. Wenzel

Signature:

Date: 2-11-04 License #: 22148

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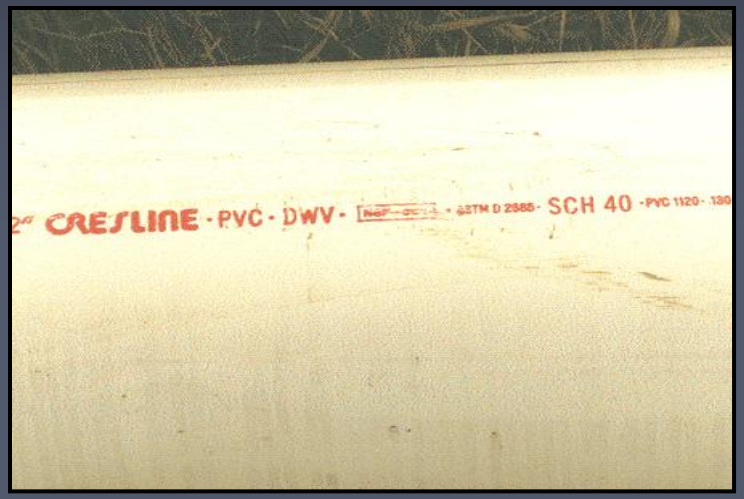
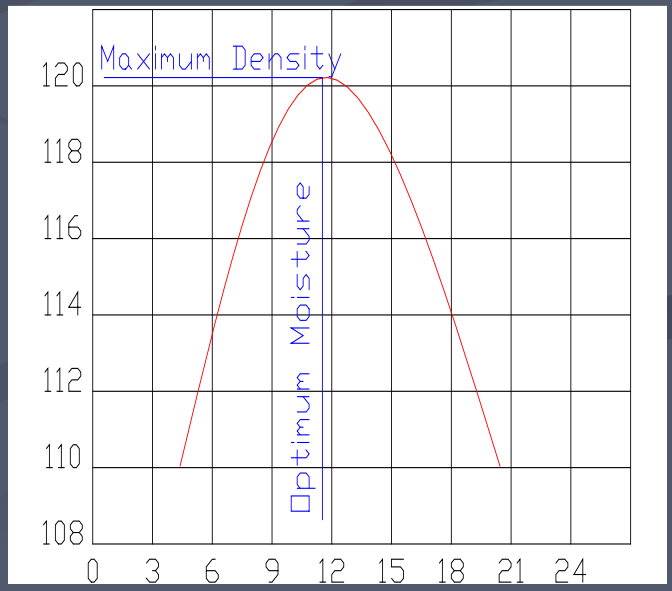
Minnesota Board of Water & Soil Resources

Engineering/Construction

Construction & Material Specifications





Minnesota Board of Water & Soil Resources

Engineering/Construction

Construction & Material Specifications

Minnesota Board of Water & Soil Resources

Engineering/Construction

Application Requirements

- Design Report
- Construction Plans
- Construction and Material Specifications
- ***Construction Inspection and Certification Plan***

Construction Inspection & Certification Plan

Inspection Plan
3/5/07

Sample Project
Wetland Banking Plan
Freeborn County, MN
Section 12 Freeboard Township

A. General

The work to be accomplished on this project consists of:

1. Common excavation and earthfill
2. Tile investigation and tile removal
3. Installation of tile and associated components
4. Installation of Trickle Drain Outlet
5. Installation of a culvert for water control and associated components
6. Installation of a vinyl sheet pile water control structure and associated components
7. Placement of rock riprap and geotextile
8. Shallow wetland scrape
9. Seeding and mulching

This project is an Engineering Job Class IV. A pre-construction meeting should be scheduled with the Contractor, Engineer and Project Technician(s) all present.

B. Items of Work to be Inspected

Construction layout and checking shall follow Minnesota Engineering Procedure #4-V as stated in the Engineering Field Handbook, pages 5-66 through 5-68.

Common Excavation and Earthfill
Periodic inspection will be required for salvaging and spreading topsoil to ensure entire area under the planned fills is stripped as shown on the plans. Periodic inspection will be required for the planned earthfills to ensure suitable borrow material is used following requirements shown on sheet 2 of the plans. Compaction of the earthfill shall be as specified with no testing required. The BWSR Project Engineer or representative thereof shall be present for the investigation of existing tile and the subsequent embankment layout associated with the embankment for basin #1.

Tile Investigation and Tile Removal
Periodic inspection will be required to ensure all tile is located and removed as planned. Any tile investigation trenches shall be not be within 25-feet of planned embankments unless other wise approved. The Tile Main parallel to the Branch A of the County Ditch and under the embankment for basin #1 shall be located prior to constructing the basin #1 tile blocks for the basin #1 embankment. The BWSR Project Engineer or representative thereof shall be present during this investigation as per the construction note on sheet 4 of the plans.

General Review Components

- General Project Information
- Wetland Crediting
- Vegetation Establishment
- Engineering/Construction
- *Monitoring/Performance*

Monitoring/Performance

- Project monitoring plan (5 year min.)
- Should be tied to identified goals, performance standards, and credit allocation schedule
- Should have a hydrology component when hydrology restoration or creation - wells and staff gauges
- Vegetation assessment methods

Session Outline

- Goals of The Review Process
- Where / When Things go Wrong
- The Review Process
- General Review Components
- ***Key Restoration Strategies***
- Roles and Responsibilities
- WCA Rule and Program Guidance
- Making Difficult Decisions

Key Restoration Strategies
Wetlands and Upland Buffers

Key Restoration Strategies
Wetlands and Upland Buffers

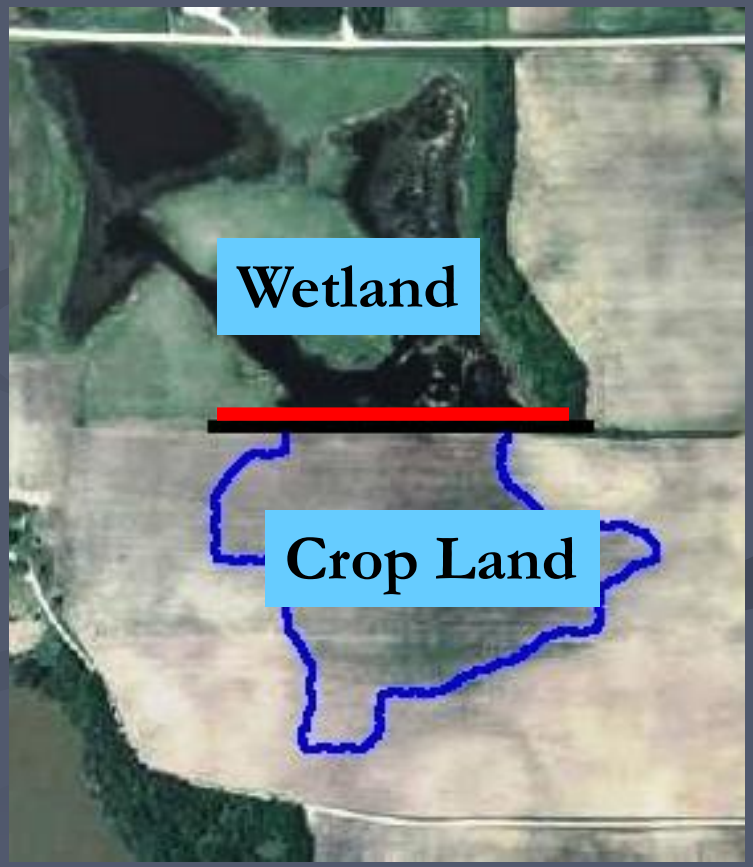
- Understand Pre-Drainage Wetland Type/Extent

Should be the Target or Goal for Most Restoration Projects

Key Restoration Strategies
Wetlands and Upland Buffers

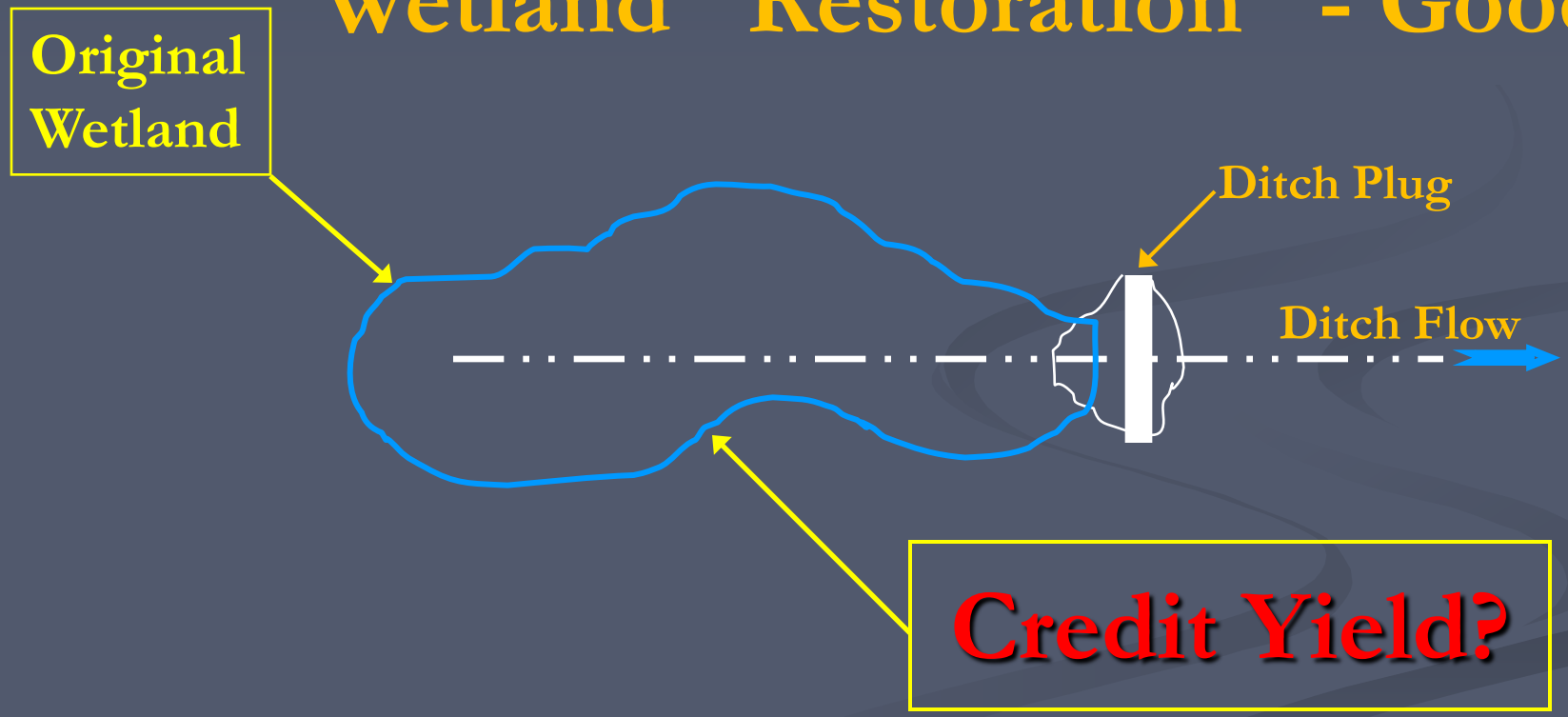
- Understand Pre-Drainage Wetland Type/Extent

Avoid Restorations on Split or Partial Basins



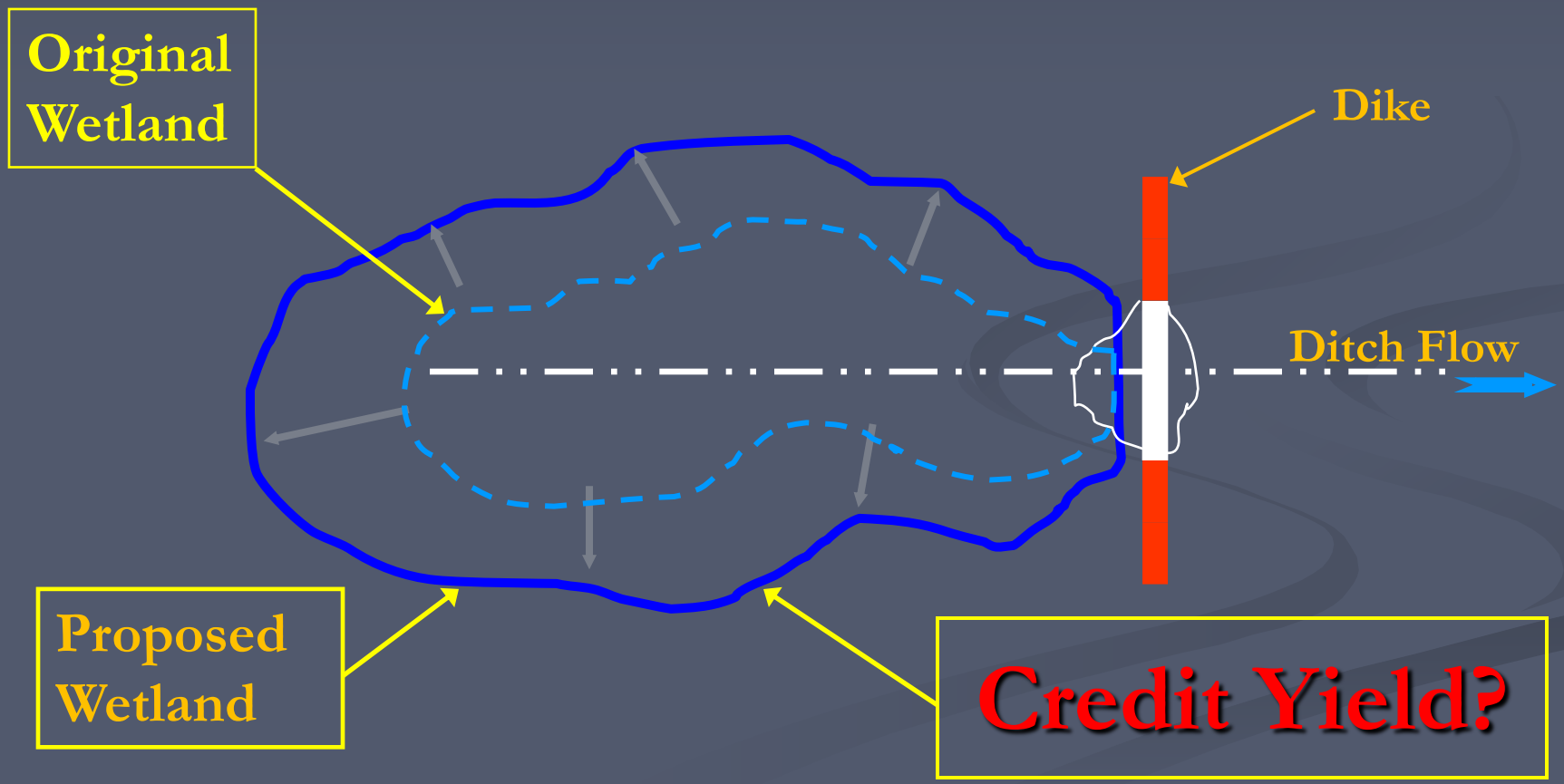
Key Restoration Strategies
Wetlands and Upland Buffers

Wetland "Restoration" - Good



Key Restoration Strategies
Wetlands and Upland Buffers

Wetland "Enhancement" – Not Good



Key Restoration Strategies
Wetlands and Upland Buffers

- Use Durable, Long Lasting Materials and Sound Restoration Strategies

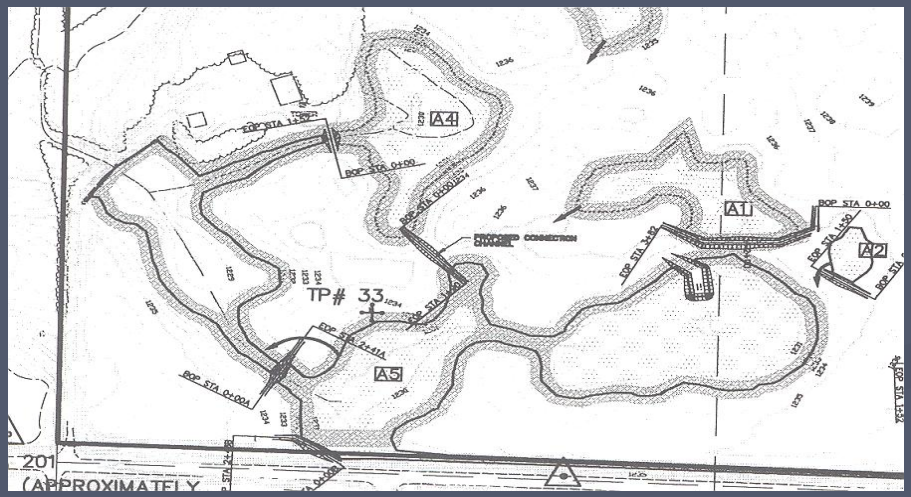
Key Restoration Strategies
Wetlands and Upland Buffers

- Use Durable, Long Lasting Materials and Sound Restoration Strategies

Key Restoration Strategies
Wetlands and Upland Buffers

Construction/Vegetation Planting Sequencing

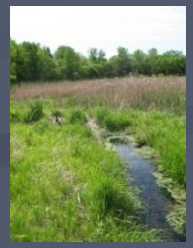
- *Site stabilization – erosion control*
- *Construction coordination/planning*



Key Restoration Strategies
Wetlands and Upland Buffers

Seeding/Planting Methods

0.5 cm of sediment will reduce 90 percent of wetland seed emergence *



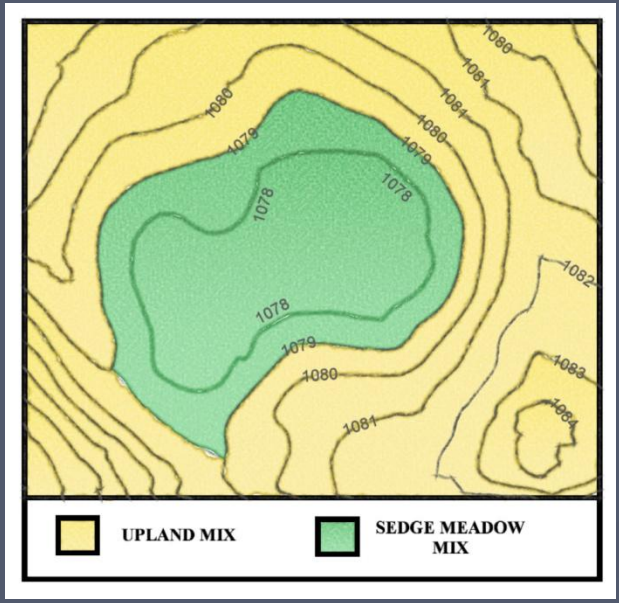
- ✓ Stabilize uplands first if needed
- ✓ Use temporary covers or mulch
- ✓ Pay attention to water level control
- ✓ The smaller the seed, the greater the impact of sediment

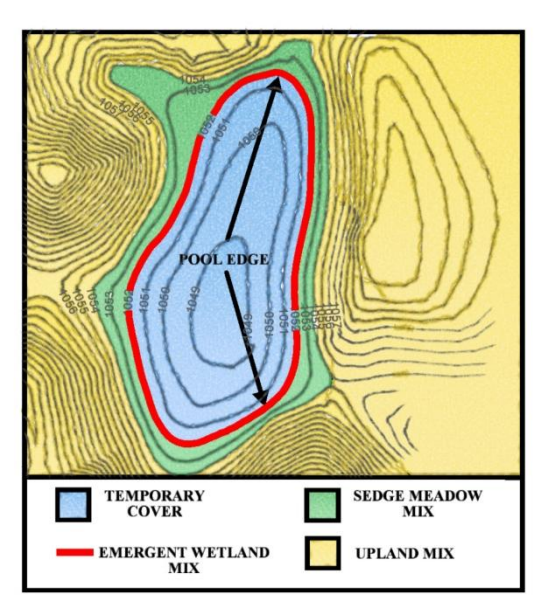
* Gleason, Robert A. 2003. Effects of Sediment Load on Emergence of Aquatic Invertebrates and Plants From Wetland Soil egg and Seed Banks, Wetlands, Vol. 23, No. 1, pp 26-34

Key Restoration Strategies
Wetlands and Upland Buffers

Timing – Spring vs Fall Seeding

Topography may influence when seeding/planting is conducted

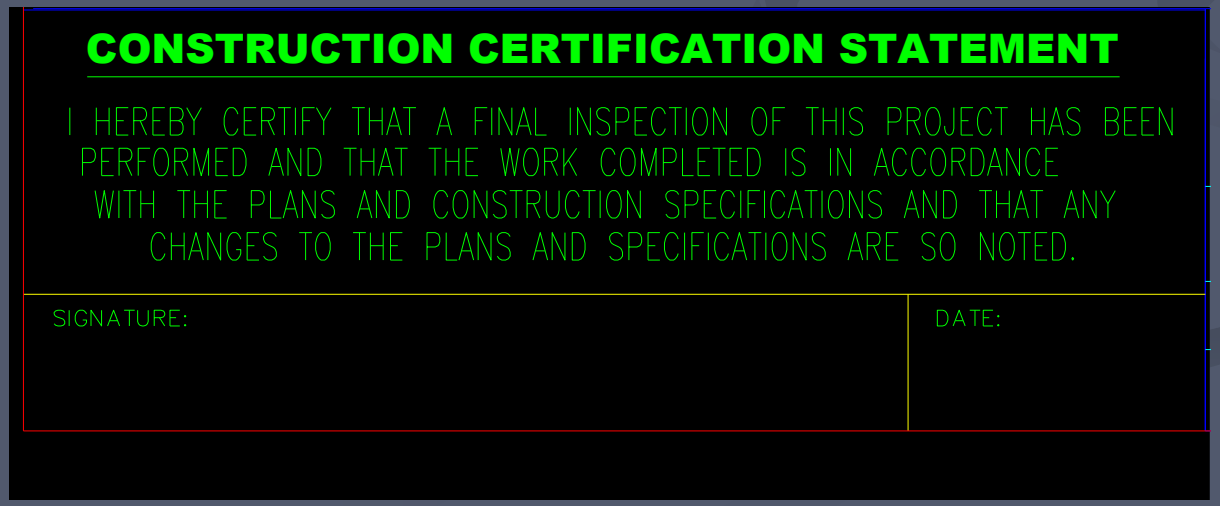




Key Restoration Strategies
Wetlands and Upland Buffers

Oversight

- Ensure that construction is done according to the approved plan



Session Outline

- Goals of The Review Process
- Where / When Things go Wrong
- The Review Process
- General Review Components
- Key Restoration Strategies
- *Roles and Responsibilities*
- WCA Rule and Program Guidance
- Making Difficult Decisions

Roles and Responsibilities - *Why Should We Care?*

- Oversight Responsibility for WCA
- Oversight of Long-Term Maintenance
- Project Enforcement

Prescribed Burn

Roles and Responsibilities - *Why Should We Care?*

Potentially large, long-term costs for all of us to address problems resulting from poor decisions made today

Roles and Responsibilities - *Why Should We Care?*

The "Dreaded Phone Call"

Session Outline

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WCA Rule and Program Guidance

WCA 2008 Rulemaking Results

- Improve "quality" of banking/ replacement sites (goal)
- Provides greater ability to say no to poor projects and to able to do it early in the process

WCA Rule and Program Guidance

8420.0522 Subp . 5A

- Replacement projects **should** take advantage of naturally occurring hydrogeopmorphic conditions with limited landscape alterations
- Restorations are **preferred** over creations

WCA Rule and Program Guidance

8420.0522 Subp . 5B

- Replacement projects that would result in wetland types or characteristics that do not naturally occur in the landscape where the replacement will occur must be denied

WCA Rule and Program Guidance

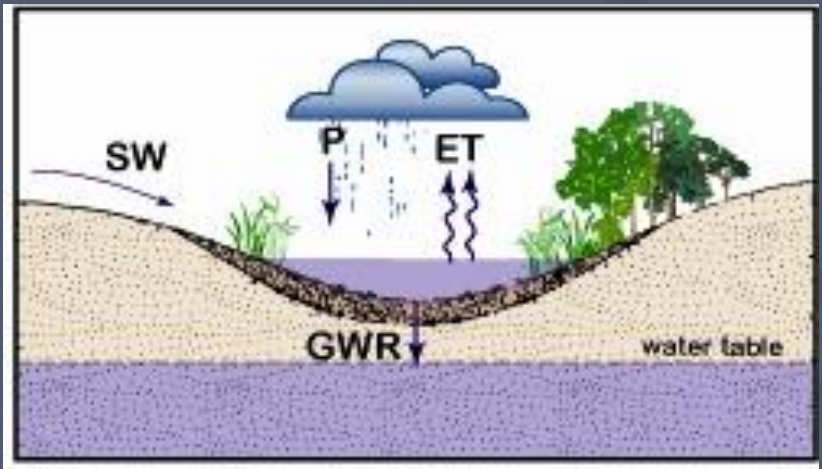
8420.0522 Subp . 5C

- Replacement projects must be located and designed, to the maximum extent practicable, to be self-sustaining once performance standards have been achieved

WCA Rule and Program Guidance

8420.0528 Subp . 3A

- Restored wetlands should emulate the hydrology and vegetation of the pre-settlement wetland condition



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- *Making Difficult Decisions*

Making Difficult Decisions

- Use good judgment and expertise
- Be reasonable, have an argument based in rule and/or technical standards

Making Difficult Decisions

- Seek help when needed

- If you say no, do it early in the process (if possible)

In Summary

- Provide clear, consistent expectations
- Provide Comprehensive, Early Evaluations of New Projects
- Ensure that public interest is served

Minnesota Board of Water & Soil Resources

Questions?